

Grade 5

Science Booklet

FISRT TERM

2024 / 2025

Theme one

System

Unit (1) interaction of living organisms



Lesson 1

Plants

❖ There are variety of plant around us.

Growth Stages of plants



plants were seeds and then got planted.



They grow and survive in the presence of water, air, and sunlight



They wither and die when they are left without sunlight and water.

Plant needs

(1) What do plants need to grow?

plant needs

- sunlight
- water
- carbondioxide (Air)
- Soil

AIR

Sunlight + Carbon dioxide → Photosynthesis → Sugar, Oxygen

- The plant consists of root, stem and leaves which help the plant to make its own food by **photosynthesis process.**

Flower
Leaf
Fruit
Stem
Root

1 **Roots** — Absorb water and salt from soil

2 **Stem** — Transports water and nutrient from soil to leaves

3 **Leaves** — Absorb sunlight and carbon dioxide

4 **Flower** — It is responsible for **reproduction**

Needs for living organisms to survive

plants	Animal	human
❖ **Air** ❖ **water** ❖ sunlight ❖ nutrient from soil ❖ A Space to grow	❖ **Air** ❖ **Water** ❖ Food ❖ shelter	❖ **Air** ❖ **water** ❖ food ❖ shelter

Essential and non-essential needs of plants

Essential needs	Non-essentials needs
1) water **2) carbon dioxide** **3) sunlight** **4) suitable area**	**1) sugar** **2) oxygen** **3) soil**

Worksheet

1 Choose the correct answer

1. All of the following are from the plant basic needs except………

a. sunlight .... b. air c. water d. shelter

2. Plants take………………from the air to make their own food.

a. sunlight .... b. carbon dioxide c. water d. oxygen

3. Plants need………….. to make photosynthesis.

a. nutrients absorbed from soil b. sunlight

c water d. All the pervious answers

4. When the plant is placed away from the source of light, it grows .... …………

a- strong b. healthy c. weak d. green

5. Hydroponic systems are used to replace the…………..for the plant.

a- soil b. sunlight c. water d. carbon dioxide

2 Put (√) or (×)

1. Plants make their own food and use the energy from the food to grow. ( )
2. Seeds can germinate in and out of the soil. ( )
3. Plants release oxygen as a waste product during the photosynthesis process. ( )
4. Sunlight is a basic need for the plant, so plants grow toward it. ( )
5. Plants and animals can make their own food by themselves.( )

3 Complete the following sentences:

1. Different plants have three main common structures which are stem, ...and…………..

2. Plants absorb…………and…………..from the soil through their ……………………………………….

3. Plants make their own food through process that takes place in their………..

4. The stem carries water and nutrients from……………to…………..of the plant.

5. The plants use the light of……………..to make their own food.

6. The food of plant is a type of…………..which is made in their…………by photosynthesis process.

7. Soil is the source of and nutrients which the plant need to make it's…………..

4 Write the scientific term of each of the following:

1. A gas taken from the air by leaves to help the plant to make its own food. (……………….)

2. A liquid substance that plants, animals and human need to survive. (…………………)

3. A part of the plant that carries water and nutrients from the roots to the leaves. (……………….)

4. The process by which plant can make its own food. (……………….)

5. The gas which is released from plants during photosynthesis. (…………………)

6. The source of energy that the plant use to make photosynthesis (…………………)

5 Give reason for:

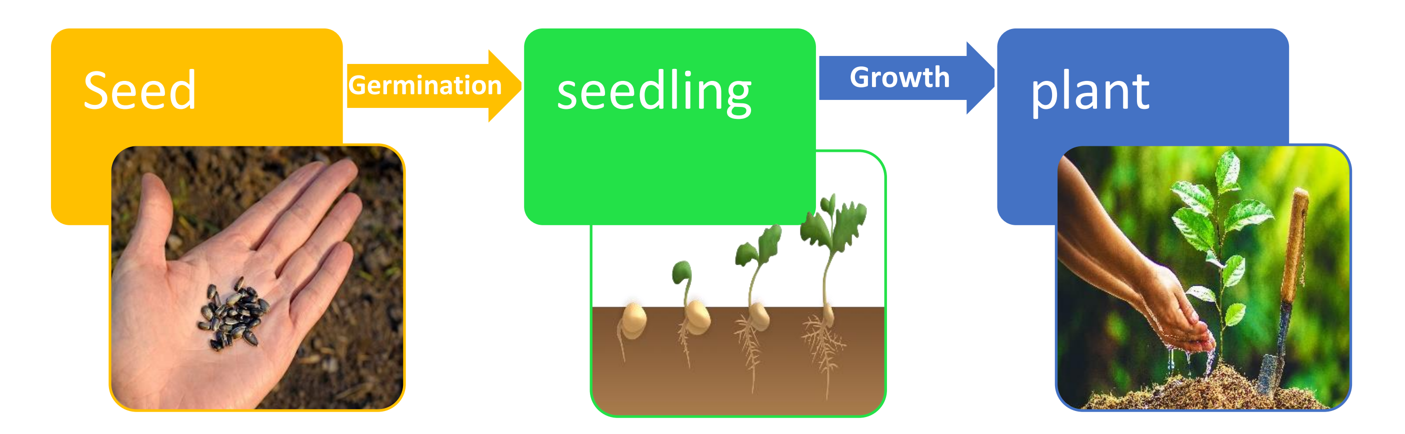
1. Root have important role in photosynthesis process.

2. Some plant don't need soil as a basic need.

3. Photosynthesis process is important for the plant to survive.

Lesson 2

Plant growth stages



Germination It is a process in which the seed begins to grow

Seedling its a very young plant

Seed germination

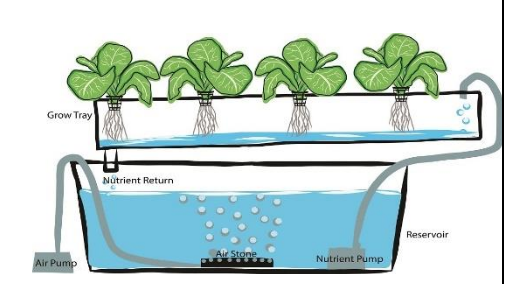
Seed needs: **1. Water** **2. Air** **3. Suitable area**

- The Seed doesn't need **Sunlight.**
- The seed feed on the food inside it during germination.

- Some plants don't need soil to grow such as: **Waterlily (grow on the water)**
- Some plant can grow in **hydroponic System** instead of soil**.**

Hydroponic system:

- A place full of water that contains important minerals for the plant to grow.



Lesson 3

Photosynthesis process

(The process by which the plant makes its own food)

❶ Leaves



- ✓ Absorb sunlight by **Chlorophyll**
- ✓ Absorb carbon dioxide by **Stomata**

Stomata: They are tiny openings on leaves allow air to move into leaves

---

❷ Stem

- ✓ It transports water and nutrients upward through vessels called **xylem.**

❸ Root

- ✓ Absorb water and salt by Root Hairs

All these substances react to produce:

1. **Sugar** (plants food)
2. **Oxygen** (waste product for the plant)



Give a reason

1-Most of plants need soil to grow.
To get water and nutrients.

2-Plant needs sunlight
To make its food by photosynthesis.

3-Plants need carbon dioxide.
To make its food by photosynthesis.

4-The plants grow better in the soil.
Because the soil gives the nutrients to plant.

Evaluation

1 Complete the following:

1. From the plants part ....,.................,................
2. The basic needs of plant to grow are ....,..........,............
3. Plant root absorbs nutrient from the ....

2 Put true or false

1-plants are exists in everywhere around us ( )

1-The ecosystem consists of living and non-living things ( )

3-Plant can grow and survive in the absence of sunlight ( )

4- All living organism can make their own food. ( )

3 Choose the correct answer:

1-when seed germinate it grows to ....

.A flower B.seedling C.plant D.fruit

2-A plant can grow and survive without ....

A. sunlight B.carbondioxide C.soil D.water

3-both plant and human need ....to grow and survive

A. sunlight B.soil C.water D.carbondioxide

4-Green plant can absorb nutrient from the soil by ....

A. flower B.root C.leaves D.stem

5-Green plants can make their food by .... process.

A. photosynthesis B.respiration C.digestion D.thinking

6- The .... of plant helps in the transmission of the nutrient and water to the leaves.

A. stem B.root C.flower D.leaves

7- The .... of plant absorbs sunlight and carbon dioxide to make photosynthesis process.

A. stem B.root C. flower D.leaves

8-All of the following structure exists in plant except............

A. stems B.root C.blood D.leaves

4 Write the scientific term:

1-The only living organism that can make its food

(.........................)

2-The vital process that takes place by green plant to make their food

(.................)

3-Part of the plant absorbs water and salt from soil.

(.......................)

5 Classify these words in the following table:

(1) soil - oxygen -carbon dioxide -sugar - sunlight- water

Essential needs	Non-essential needs

6 Study the following figures, then answer the questions.

-1

1 ....

2 ....

3 ....

4 ....

Flower

Which part of the plant is responsible for?

1-Absorbong the nutrient ....

2-Manufacturing of food

....

3-Transimission of nutrient ....

7 Complete the following:

1. The leaves (green pans) absorb……………. by especial organelle called . ………………… …………
2. The leaves absorb from the air, through tiny holes called
3. The roots absorb ………………… ……… and …………. ……… from the soil.
4. The photosynthesis process produces and……….
5. The plant change the … …………………. …. energy into ……………………energy stored in the plant's food during the Photosynthesis process.

8 Write the scientific term :

1. A part of plant that fixing the plant in the soil. (…………………)
2. A part of plant represents the reproductive organ of the plant (…………………)
3. It is the process in which the seed begins to grow. (…………………)
4. It is very young plant. (…………………)
5. A part of plant that transports the water and mineral salts from the root to the leaves. (…………………)
6. A part of plant that stores the food (…………………)

9 Put √ or x

1. Plants need the sunlight to grow. ( )
2. Seed feed on the food which stored in inside it. ( )
3. Sunlight from essential needs of plants. ( )
4. Plants need the nitrogen gas to grow. ( )
5. Human can make his own food. ( )
6. Soil from essential needs of plants. ( )
7. Plants need carbon dioxide to make food. ( )
8. Suitable area from non-essential needs of plants. ( )

9. Plant gets food from other plants and animals ( )

10. Human doesn't need carbon dioxide gas. ( )

11. Oxygen from essential needs of plants. ( )

12. Plants need oxygen to make its food. ( )

13. Seeds need sunlight to grow. ( )

14 The seeds grow better in the soil than paper tissues. ( )

10 Give reason :

1. Most of plants need the soil to grow.

....

2. Plants need the sunlight to grow.

....

3. Plants need the carbon dioxide gas to grow.

....

4. Soil from non-essential needs of plants

11:What happen when

1. The seed found the suitable conditions for germination.

…………………………………………………………………………………….

2. If the sunlight or water or carbon dioxide gas not found

……………………………………………………………………………….

3. The seed did not find the suitable conditions for germination.

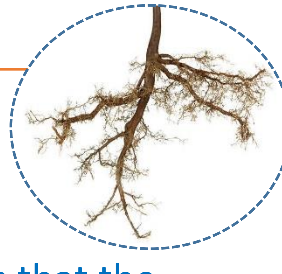
………………………………………………………………………………

4. We put a plant in the dark.

……………………………………………………….. ………………….

Parts of Plant

1 Roots



- Anchor(fix) the plant in the soil
- Absorb water and nutrients by Root hair
- Root hairs: increase the amount of water and nutrients that the plants can take.



2 Stem

- Transports the nutrients to the rest of the plant through tubes called **Xylem vessels**

Types of stems

(1) Wooden Stem



It is a hard stem made of wood

Ex: Tree trunk and shrubs

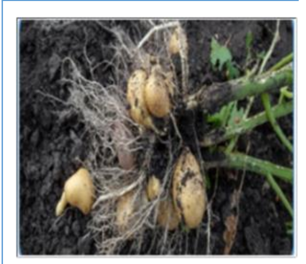
(2) Upright stem



It is generllay an erect stem.

Ex: Most flowers

(3) Tubers



It extends underground.

Ex:Potato plant

(4) Climber Stem



It is a long and flexible stem that climbs up a support.

Ex: Vines(Grapes)

(5) Runner stem



It runs horizontally along the ground.

Ex: Strawberry



- They make food for the plant by photosynthesis process.
- They contain a green pigment called chlorophyll.
- All leaves have tubes running through them called (xylem) that carries water to the stem.

Types of leaves

- Narrow and look like needle
- flat and wide



Ex : Pine tree leaves

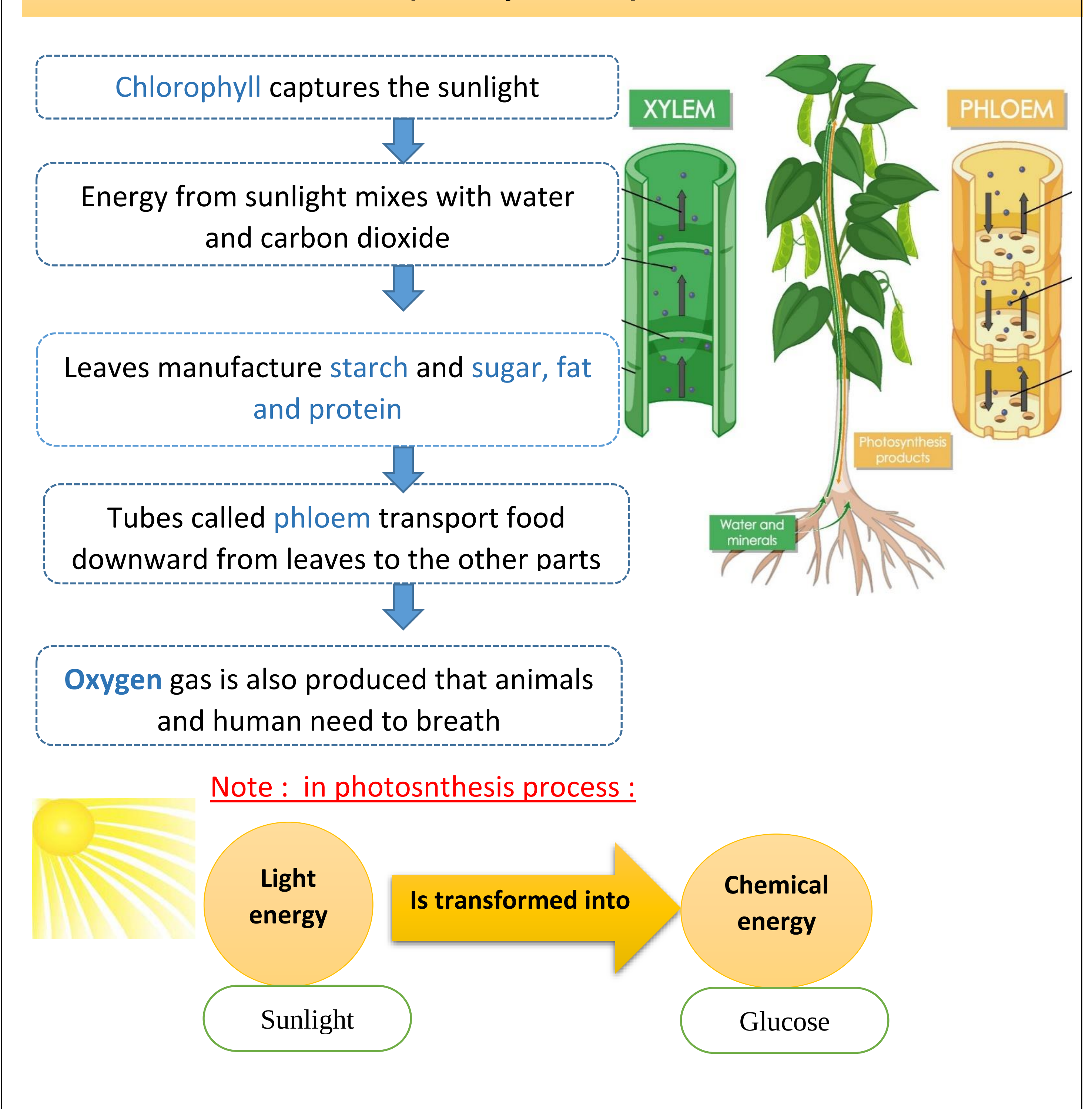


Ex: Banana leaves

photosynthesis process

It is the process takes place inside the **leaves** to make the plants food to grow and survive.

How does photosynthesis process occur?



Worksheet

1 Choose the correct answer:

1. The plant's…………………anchor it in the soil.

a. leaves b. stems c. roots d. flowers

2. There are…………….in the plant's roots that help the plant to get more water and nutrients.

a. vessels b. root hairs c. stomata d. flowers

3……….plant has climb stem.

a. Potato b. Tomato c. Vine d. Pine

4. The kind of stems that extend underground are called……………..

a. climb stems b. tubers c. runners. d. wood stem

5. Potato plant has…………………stem.

a. upright b. climb c. tuber d. runners

6. Apple trees have……………

a. wood stems, b. climb stems c. tubers. d. runners

7…………….tree has narrow leaves.

a. Potato b. Pine c. Acacia d. grapes

8. The green plants can make their own food through………..

a. roots. b. stems. c. leaves. d. flowers

9. The green colour of plant's leaves is due to the presence of ……………….

a. stomata b. chlorophyll c. phloem d.xylem

10. Food materials are transported from the leaves to other parts of the plant through……………………..

a. xylem. b. phloem. c. chlorophyll. d. stomata.

2 Put (√) or (×)

1. The plant is fixed in the soil by the help of its roots. ( )
2. Plant's stem has hairs that absorb oxygen gas from the air ( )
3. Xylem helps the plant to get water from the soil. . ( )
4. A tree trunk is a type of stems called runners. ( )
5. Potato plants have stems called tubers. ( )
6. Chlorophyll in plant's roots absorbs sunlight. ( )
7. The leaves of pine trees are flat and wide. ( )
8. Phloem transports food materials downward from the leaves to other parts of the plant. ( ) ( )
9. Photosynthesis process produces carbon dioxide gas that help animals and humans to breathe. ( )
10. Plants need sunlight, oxygen gas and water to make its own food. ( )
11. Vines have a kind of stems called climb stems. ( )

3 Write the scientific term:-

1. Small structures in the plant's roots that increase the absorption of water and nutrients from the soil. (.....................)
2. A part of the plant that fix it in the soil. (.....................)
3. A part of the plant that supports its leaves and flowers. (.....................)
4. The kind of plant's stem in vines. (.....................)
5. The stems that are extended above and along the ground. (.....................)
6. A plant that has a tuber stem. (.....................)
7. It is found in plant's leaves that gives them green color and absorbs energy from the sunlight. (.....................)
8. Tubes in the plant that transport food materials from the leaves to other parts of the plant. (.....................)

Lesson 4

Comparing plant and human system

Can you answer ?

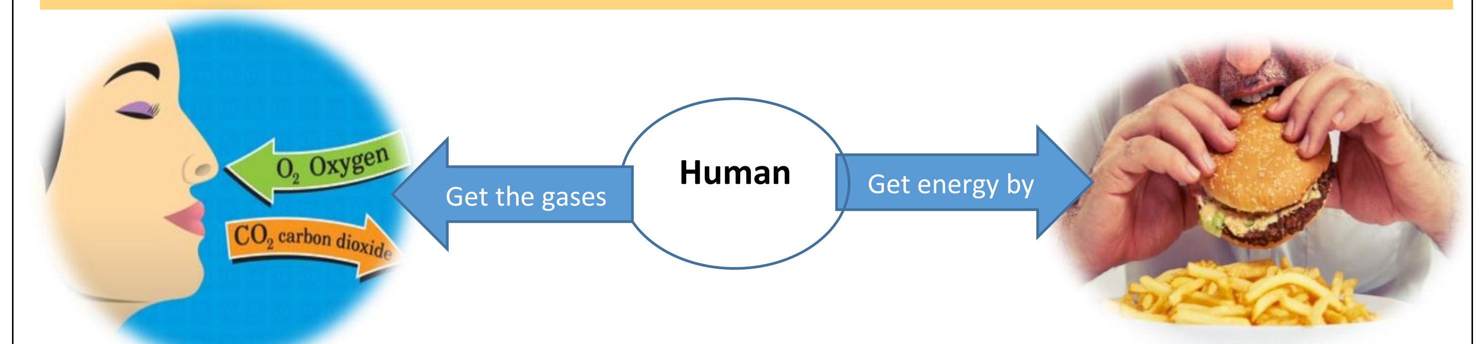
Which system is responsible for digestion and absorption ?

(digestive system – resipiratoy system)

Which system is responsible for breathing ?

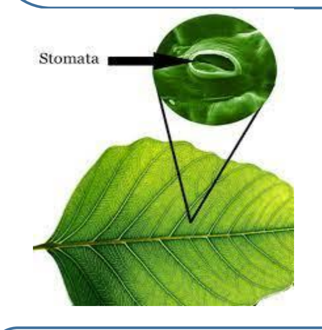
(digestive system – resipiratoy system)

How do humans and plants obtain the energy and gases needed for survival?

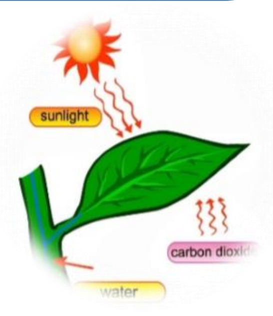


- Air enters through nose or mouth then to lungs, where oxygen is absorbed to circulating body

- Glucose and other nutrients enter our body through digestive system.



Get the gases | **Plant** | Get energy by



- Gases enter the plants through leaves

- Plants get energy from glucose by photosynthesis process

Comparing human and plant Systems

1 Human circulatory system

Structure: it consists of heart and blood vessels and blood

heart

blood vessels containing blood

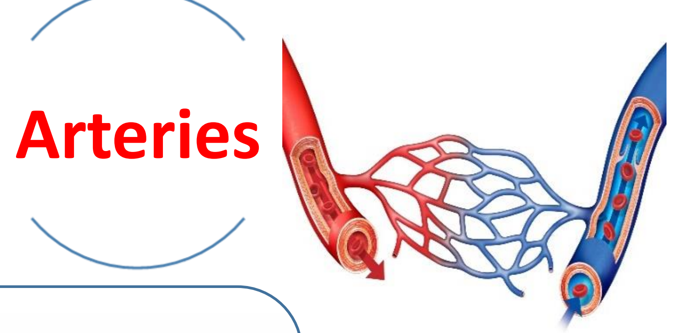
Blood vessels: -

They are tubes that transport the nutrient and oxygen to all body cells

.

Types of blood vessels

Arteries



veins

- They carry blood rich in oxygen and glucose from heart to all body cells and organs.

- They return the blood rich in carbon dioxide and low in nutrient back to the heart and lung.

Notes :

(1) Blood moves only in one direction through veins and arteries

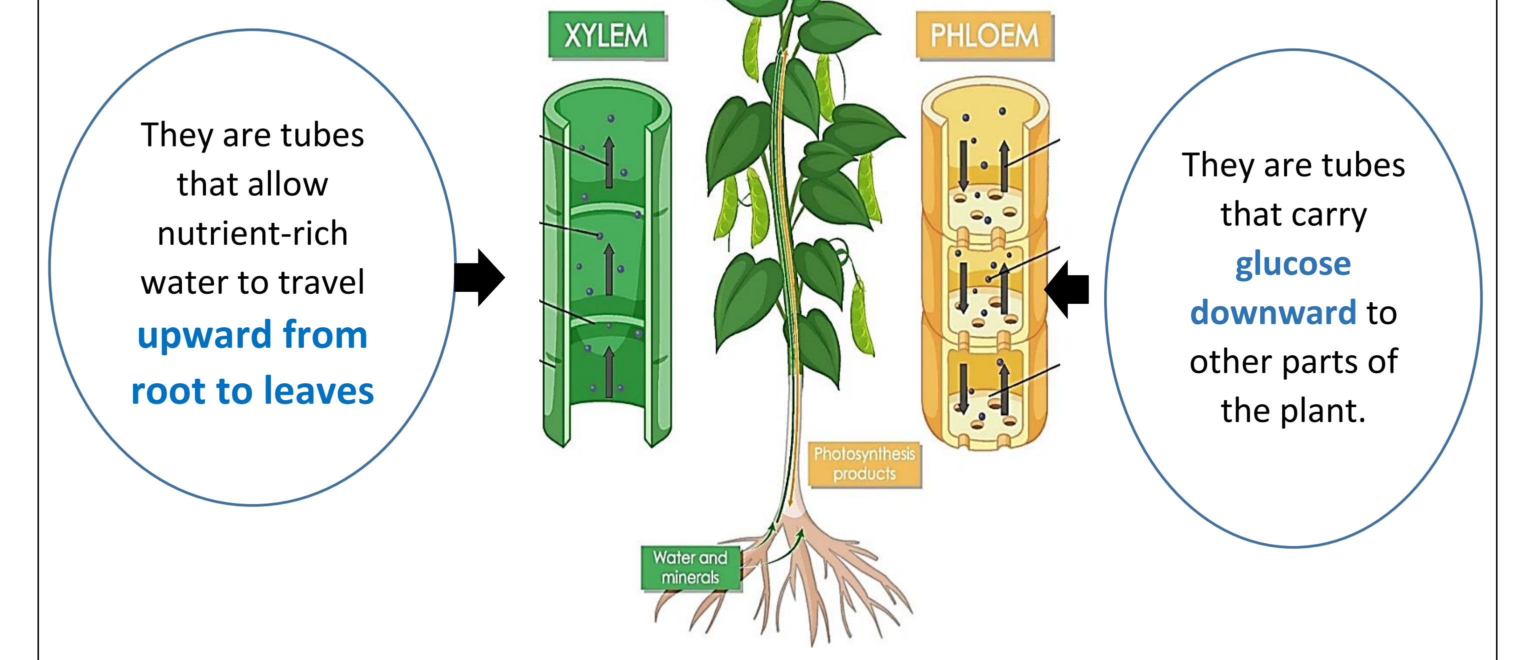
(2) You can see your veins through your skin in your hand.

2 Plant Transport System

Transport System (Vascular)

It is the system that transport the plants need throughout the plants parts.

Structure: it consists of vascular bundles (Xylem and phloem) .



P.O.C	Plant Transport system	human circulatory system
Picture		
Similarities	They transport nutrient and gases to all body cells	
differences	**It consists of**: 1- Xylem 2- Phloem	**it consists of:** 1- 1-heart 2- 2-blood vessels 3- blood

Quiz

1. Complete

(Phloem –carbon dioxide- xylem-oxygen-sugar)

1-……………………….is one way vessels in the plant that transport water and nutrient.

2-phleom transport ……………. produced in the leaves to all parts of the plant.

3-Generally, arteries carries blood rich in …………………….

Write the scientific term:

1-They carry blood rich in oxygen and glucose away from the heart. (…………………………….)

2- System inside the human body that is responsible for transportation of blood throughout the body. (…………………….)

Reproduction of plants

- Some plants have large colorful flowers.
- Some other plants, such as grasses, have very small flowers and some flowers are not very colorful.
- Flowers are the reproductive parts of many plants.

plant reproduction It is the process of making new plant .

Flowers They are the reproductive parts of many plants.

Function of the flowers:

1. Help plants to reproduce 2. Produce seeds

Examples

Sunflower

They have a small dark color seeds in the center of the flower.



What happens if the seed receives water, air and correct temperature?

-It will grow into a new plant.

Worksheet

1 Choose the correct answer

1. During photosynthesis process, the plant produces………… that provides it with energy to survive.

a. carbon dioxide gas   b. water

c. glucose sugar   d. oxygen gas

2. ……………….carry blood which is rich with oxygen and glucose from the heart to the body cells.

a. Arteries   b. Veins

c. Lungs and veins   d. Brain and veins

3. Blood rich in carbon dioxide gas return back to the heart through………….

a. arteries   . b. veins.   c. lungs.   d. xylem.

4. ……………….system in plants consists of tubes that water and nutrients move through it.

a. Digestive   b. Respiratory   c. Transport   d. Nervous

5. The system in human that moves blood in the human body is called ………… system.

a. digestive   b. respiratory   c. circulatory   d. nervous

6. Glucose sugar is transported from the leaves to other parts of the plant through……………..

a. xylem.   b. phloem.   c. roots.   d. stems.

7. Plants can produce new seeds by …………………….

a. roots.   b. leaves.   c. stems.   d. flowers.

8. The reproductive parts of many plants are called

a. veins.   b. roots.   c. leaves.   d. flowers.

9. In……………its seeds are small dark-colored objects in the center of this flower.

a. pine tree   b. sunflower   c. potato plant   d. celery

2 Write the scientific term:-

1. Blood vessels carry blood from the heart to all body parts. (....................)
2. Blood vessels carry blood from the body parts and return it back to the heart. (....................)
3. The human body system that is responsible for transportation of blood and other fluids throughout the body. (....................)
4. A system of tubes through which water, nutrients and plant food are carried all over the plant. (....................)
5. Parts of the plant that are responsible for reproduction (....................)
6. The process of producing new plants. (....................)

3 Complete the following sentences :

1. Plants make their energy in the form of............... sugar during photosynthesis process.
2. Air enters plants through stomata on their.............., while it enters the human body through ....and................
3. Human circulatory system consists of..........and....................
4. Arteries carry blood rich in and oxygen from the heart to..............
5. The blood and other fluids are transported throughout the body by the.............system
6. The plant makes sugar in it's...........during photosynthesis process.
7. Transport system in the plant consists of two types of vessels which are...........and..................
8. Arteries carry oxygen and nutrients from the......... to all body parts, while....... in plant's stem carry water from the ....to the leaves

4 Give reasons for:

1. Flowers are important parts for the plant.
2. Circulatory system has an important role for human to survive.

Lesson 5

Seed Dispersal

- Seeds must travel away from parent plant so that a young plant will not have to compete with an established plant for resources. This method is called **(seeds dispersal)**

Seed dispersal It is how seeds are transpoted from one place to another.

Some Dispersal methods

1.wind

seeds are fluffy , light and feathery



Ex: Dandelion & Maple

2. water

seeds are light and can float



Ex: Coconut

3.Animal and human transport

Seeds have spines, so they can be dispersed by sticking in animal`s fur or hunan clothes



Ex: Burdock

4.Being eaten

Seeds can be dispersed If they have good taste and could be eaten by human or animals.



Ex: Tomato &Apples

Evaluation

1 Choose the correct answer:

1. The basic function of the flower is helping the plant to ....

A.	produce new plant	B.	to transport the water and mineral

2. Dandelion seeds spread by ....

A.	water	B.	wind	C.	human	D.	animals

3. Green plants and animals are similar in ....

A.	size	B.	Structure	C.	growing	D.	moving

4. In the absence of ....plant will die.

A.	oxygen	B.	water	C.	soil	D.	food

5. Manufacturing of the plants food takes place in ....

A.	root	B.	leaves	C.	flower	D.	stem

6...................allow/s air to enter into leaves

A.	xylem	B.	phloem	C.	stomata	D.	root hairs

7. All of the following parts represents the human circulatory system except ....

A.	arteries	B.	veins	C.	the heart	D.	lungs

8. Plants use the energy from .... to their own food

A	battery	b	sunlight		c	wind	d	fire

9. When a plant stem is placed in red-cooled water, the plant colour .....

A.	turns red	b.	turns yellow		c.	doesn't change	d.	turns blue

❷ Write the scientific term:

1- production of new plant (..............................)
2- Small dark parts located in the centre of sunflower. (..............................)
3- reproductive organ in many plants (..............................)
4- the method by which coconut seeds spread (..............................)
5- the method by which Dandelion seeds spread (..............................)
6- A part of the plants absorbs water from soil (..............................)
7- A vital process takes place by plants to make their food (..............................)
8- The source of energy for the plant to make photosynthesis process. (..............................)
9- Plant structure that anchors the plant in the soil (..............................)
10- The stem type of strawberry (..............................)
11- The green pigment in the plant that capture sunlight (..............................)
12- Blood vessel that transports the blood from heart to all body cells. (..............................)

❸ Choose the correct word between brackets.

1. ....Pumps the blood in human body (lungs-heart)

2. ....transport the blood to the heart ((Arteries-veins)

3. Seed with a sweet taste like seed on strawberry, are best dispersed by ....(Wind-being eaten).

4. Fluffy seeds like kapok tree seed dispersed by (water- wind)

5. The plant vascular bundle is like .... in human. (blood vessels-muscles)

Concept 2

Energy flow in ecosystem



Lesson 1

An ecosystem is a community that provides food, water, shelter to all living organisms.




Forests



Oceans

Ecosystem — Its an area that contains living organisms and non living things.

Energy flow in ecosystem

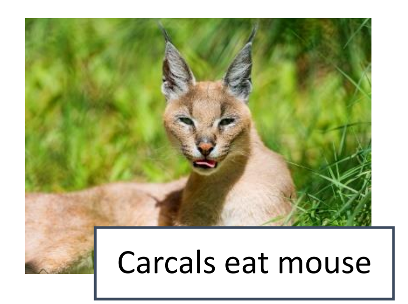
Hawks in ecosystem

- ✓ Hawks get energy from food.
- ✓ Hawks generally eat animals such as, snakes, mice, birds, and rabbits.
- ✓ Hawks don't eat plants.
- ✓ There are few predators that can attack hawks such as Eagles.

What happens if the Hawks die?

It decomposed, and its energy returned to the soil.

Another Examples of energy flow:


Carcals eat mouse


Rabbits eat grass


birds eat butterflies and worms

Why animals eat plants or other animals?

Because animals need to get energy by eating food.

Food is energy

- We need energy to do all activities in our life such as thinking, breathing, and moving.
- There are some activities which need more energy such as **physical exercises.**

The sun is the primary source of energy of all living organisms on earth.

The differences between animals and plants in getting energy

Animals	plants
• Animals and humans can't make their own food • They can get food from plants or animals.	They can make their own food by **photosynthesis** process.

Evaluation on lesson 1

1 Choose the correct answer:

1. A community that contains living organisms and non-living things is known as.....................

a. Digestive system b. Respiratory system c. ecosystem d. Vascular system

2. Living organisms that can absorb sunlight to make their food are ..

a. Animals only b. Plants only c. Animals and plant d. humans

3. Hawks get their energy from ....

a. Animals only b. Plants only c. Animals and plant d. Non-living things

4. Hawk eats a rabbit to get energy, this means that ....

a.The hawk is a prey b. The rabbit is a predator c. The hawk is a predator d. Hawk and rabbit are predators.

5. All of the following are considered as a source of energy for hawks except

....

a. snake b. seeds c. Squirrel d. birds

Caracals obtain the energy by eating ....

a. shark b. grass c. mice d. buterflies

6. We need more energy during.........................

a. Watching TV b. sleeping c. Listening to music d. Physical exercising

❷ Write the scientific term:

1-The community that contains living organisms and non-living things. (…………………)

2- The primary source of energy of all living organisms on earth. (…………………)

3- Living organisms that can absorb sunlight to make their food (…………………)

4-The gas that is produced during photosynthesis process. (…………………)

❸ Give a reason:

1-Human needs to eat some animals or plants.

………………………………………………………………………………..

2-Sunlight is important for all living organisms.

…………………………………………………………………………

❹ Match

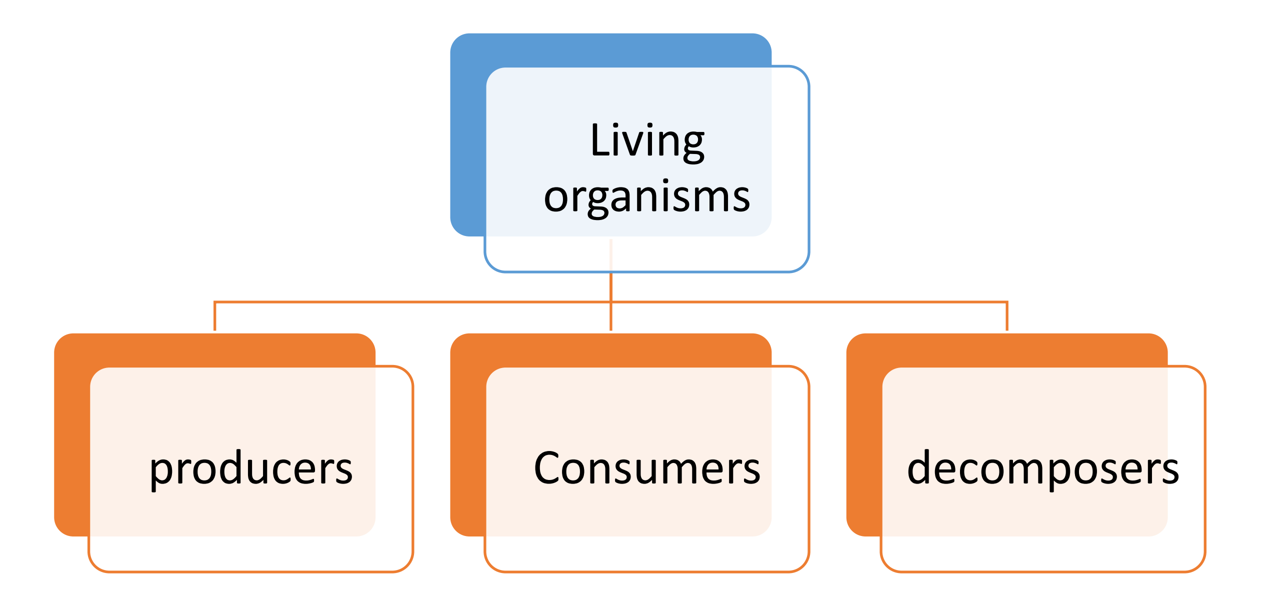
(A)	(B)
1-Carbon dioxide	a. without its energy, photosynthesis process cannot begin.
2-water	b. it is produced from photosynthesis.
3-sunlight	c. it is absorbed from soil by plant's root
4-oxygen	d. it combines with water in leaves to produce glucose sugar.

Lesson 2

Food Chain

All living organisms eat food **to get the energy** they need to **survive.**

Living organisms can be classified according to their ways of feeding, which are:



(1) Produces

➢ They are organisms that that make their food and don't feed on other plants or animals.

EX: Plants



(2) Consumers

➢ They cannot produce their food and eat other living organisms to get energy.

Types of consumers

Primary consumer

They are animals that eat plants

EX : many insects



Secondary consumer

They are animals that eat the primary consumers

Ex: Birds



Tertiary consumer

They are animals that eat the secondary consumers.

EX: large meat - eater animal (crocodiles)



(3) Decomposers

They are organisms that decompose the decayed dead organisms.

Ex: Fungi, bacteria, and worms.

Millipede

Note: Worms and millipedes produces wastes rich in nutrients which increase the soil fertility.

So, from the previous we can conclude that: -

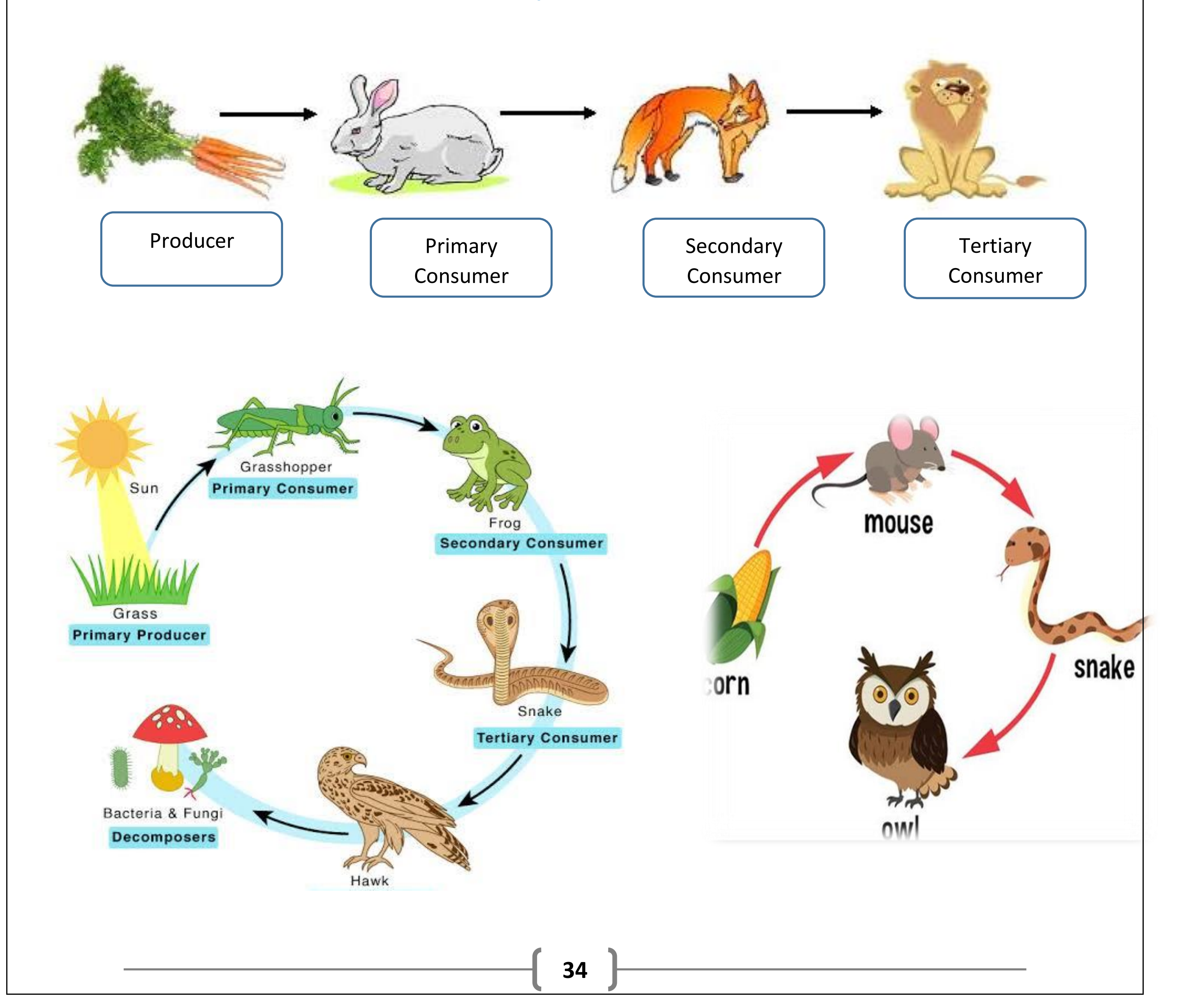
1- Energy flows through an ecosystem between living organisms.

2- This movement of energy is called (Food Chain)

Food Chain

- It is a model that shows one linear set the monvments of energy through living organisms.

Examples on food chain:



Predator and prey

Prey: The animal that is hunted and eaten.

Predator: The animal that hunts and eats another animal.

Worksheet

1 Choose the correct answer:

1. According to the way of feeding Living organisms are classified into……………

a. Two groups   b. three groups   c. four group

2. ……………..need energy to survive.

A.Consumers only

B.Decomposers only

C.Consumers and decomposers

d. produces, consumes and decomposers

3. Photosynthesis process produces……………………

a glucose sugar in consumers.   b. glucose sugar in producers.

c. water in consumers.   d. water in decomposers.

4. Nearly all plants are considered as………………

a. consumer organisms.   b. nonliving things,

c. decomposer organisms.   d. producer organisms.

6. To obtain energy to survive……………….

a. a producer eats a decomposer   b. a consumer eats a producer,

c. a butterfly eats a hawk.   d. a hawk eats a butterfly.

7. Many insects are considered as……………………

a. producers.   b. decomposers,

c. primary consumers.   d. secondary consumers.

❷ Put (√) or (X):

1. Producers don't need consumers to survive. ( )
2. All living organisms don't need energy to survive. ( )
3. Glucose sugar that is produced by producers has a low amount of energy. ( )
4. Some producers can live in hot sunny weather, but they cannot live in a completely dark room. ( )
5. Producers and consumers use carbon dioxide gas for making their food. ( )

❸ Complete the following sentences:

1. Living organisms include……………… , consumers and decomposers.
2. Producers can make sugar which is rich in energy through………… process.
3. Decomposers and…………depend on producers to get their energy.
4. The most common producers are………………………
5. The light energy of the Sun cannot flow directly to consumers and…………..
6. In a food chain, the energy flows from…………consumer to a secondary consumer.
7. Decomposers are responsible for…………nutrients to the soil, that are needed for plants growth

(4) Give reasons for:

1. Consumers depend on producers to get their energy.

………………………………………………………………………………….

2. Soil fertility depends on decomposers

………………………………………………………………………………….

Lesson 3 &4

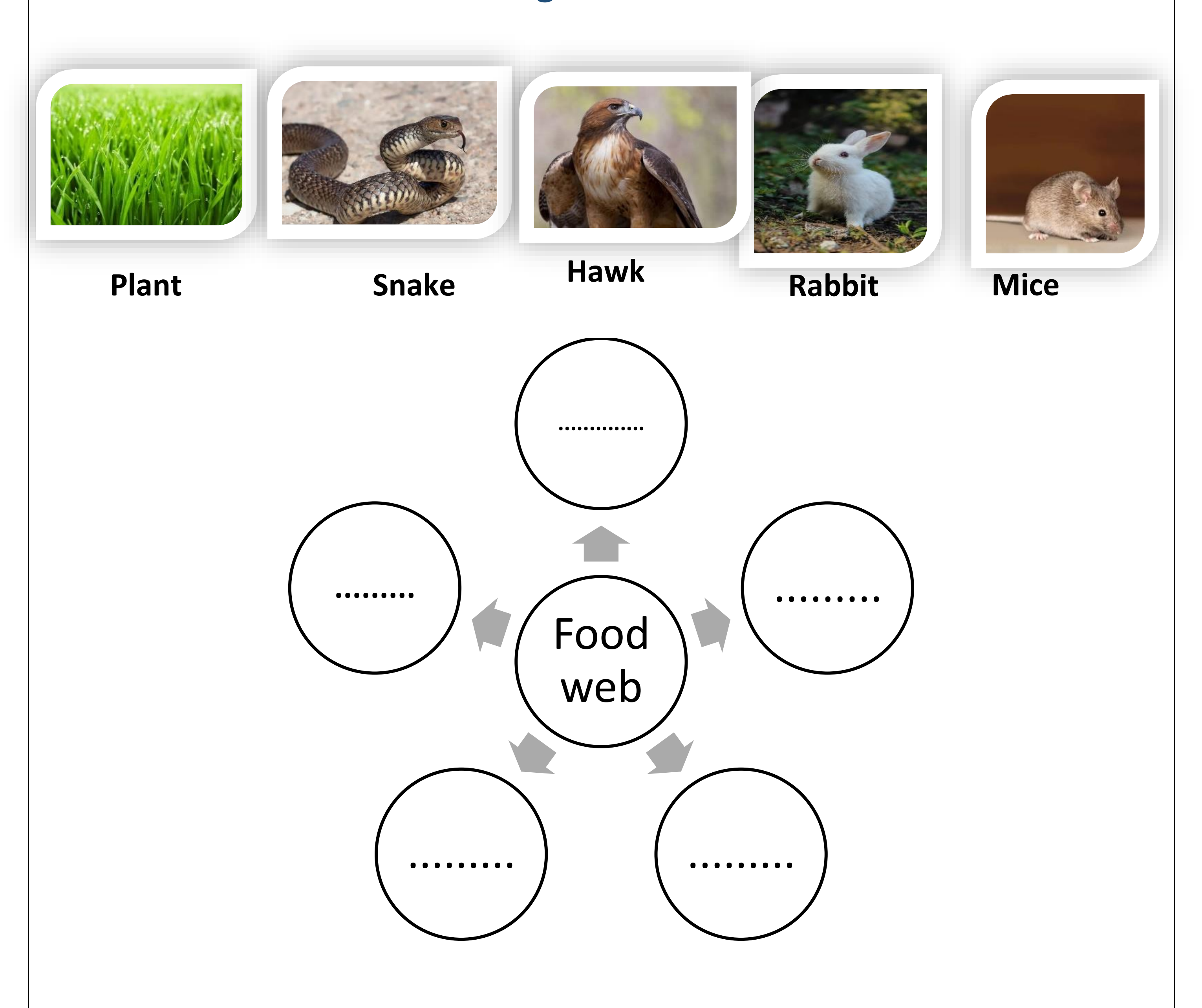
Food Web

Food web

- It is a model that shows **many differnent feeding** relationships among living organsims**.**

Let's try to make a food web!

You have the following animals:



Worksheet

1 Choose the correct answers:

1- To make a food web you must classify animals in ecosystem according to their ………………. they get.

a. water b. Light c. gas d. food

2- Which of the following food chain shows the correct way of energy flow through living organisms.

a. producer → predator → primary consumer

b. predator → producer → secondary consumer

c. producer → primary consumer → predator

3-The predator in a food web usually eats more than one type of

a. producer b. consumer c. decomposer d. plant

4- If there is no primary consumers in an ecosystem, the producer will …………….

a. increase b. decrease c. die d. Not be affected

5Human is a …………… living organism.

a. producer b. Consumer c. decomposer d. Predator

---

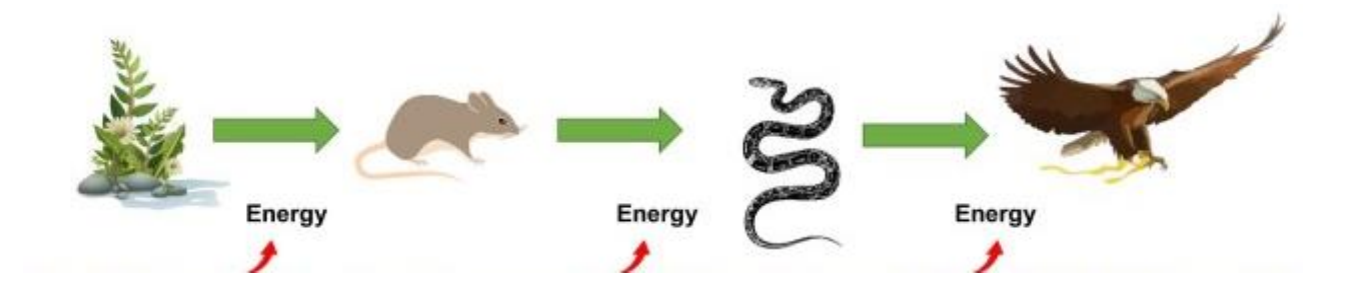
2 Put √ or x

1-The number of secondary consumers will increase if the number of primary consumers decrease in an ecosystem. (   )

2-In a food chain the energy transfers from eagles to mice. (   )

3-It is difficult to make food web if you don't know the type of food that each consumer eats.

❸ Study the following figure, then choose the right answer:



Which of the following is necessary for survival?

a. plant b. mice c. eagle d. snake

❹ Complete the following by using words between brackets.

(Primary consumer- producers – secondary consumer)

1. In any food chain, plants are considered as ....
2. If a frog eats an insect that feeds on plants, this means that the frog is a ....
3. Human can eat produces and ....

STEM in Action

Restoration ecology help the plant and animals to have a stable environment to survive.

Restoration ecology means: (Rebuilding habitats that are damaged)

Dr: Becky Barak

- She is a plant –community ecologist.
- She always loved plant and animals since her childhood.
- When she was a teenager, she studied a class in **Restoration ecology.**

Seed dispersal

Dr. Becky has learned a lot about seed dispersal such as:

There are some **sticky seeds** that stick to human clothes or animal's body.

Other plants have **light seeds** that are dispersed by wind.



Concept 3

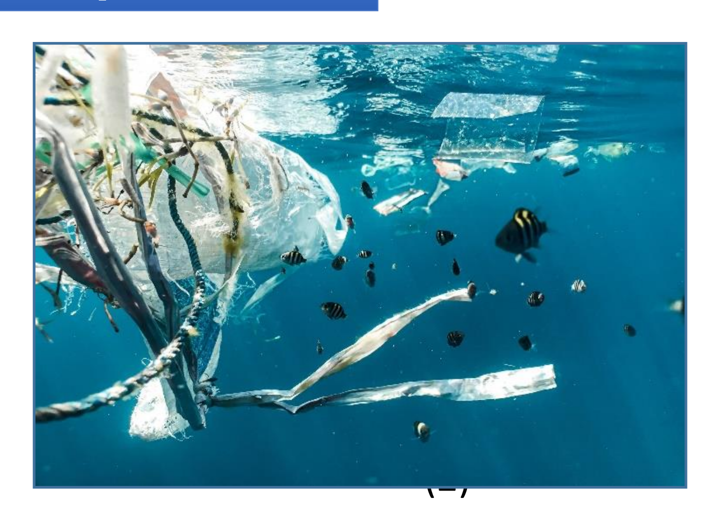
Change in Food webs



Lesson (1)

Can you explain?





What do you notice?

In picture (1): Dried ground due to drought.
In picture (2): Sea is polluted due to throwing plastic garbage into sea.

So, the ecosystem and food webs can be affected by many factors like:

1- Climate changes.

2-Pollution

3-human activities.

- **What happens if?**

1-Plants were disappeared from an ecosystem.

The consumers will need to move to other places to search for food.

2-The number of one species increases.

The food resources and shelters may disappear, so we will die.

Protecting ecosystem

- Human activities affect the marine habitat such as:



Overfishing



Throwing plastic in water

Protection the marine ecosystem in Palau Island

1. Controlling human activities and avoiding throwing wastes in oceans.

2. Fisher must not overfishing the coral reefs



Palau Island

How dose ecosystem can affect food webs?

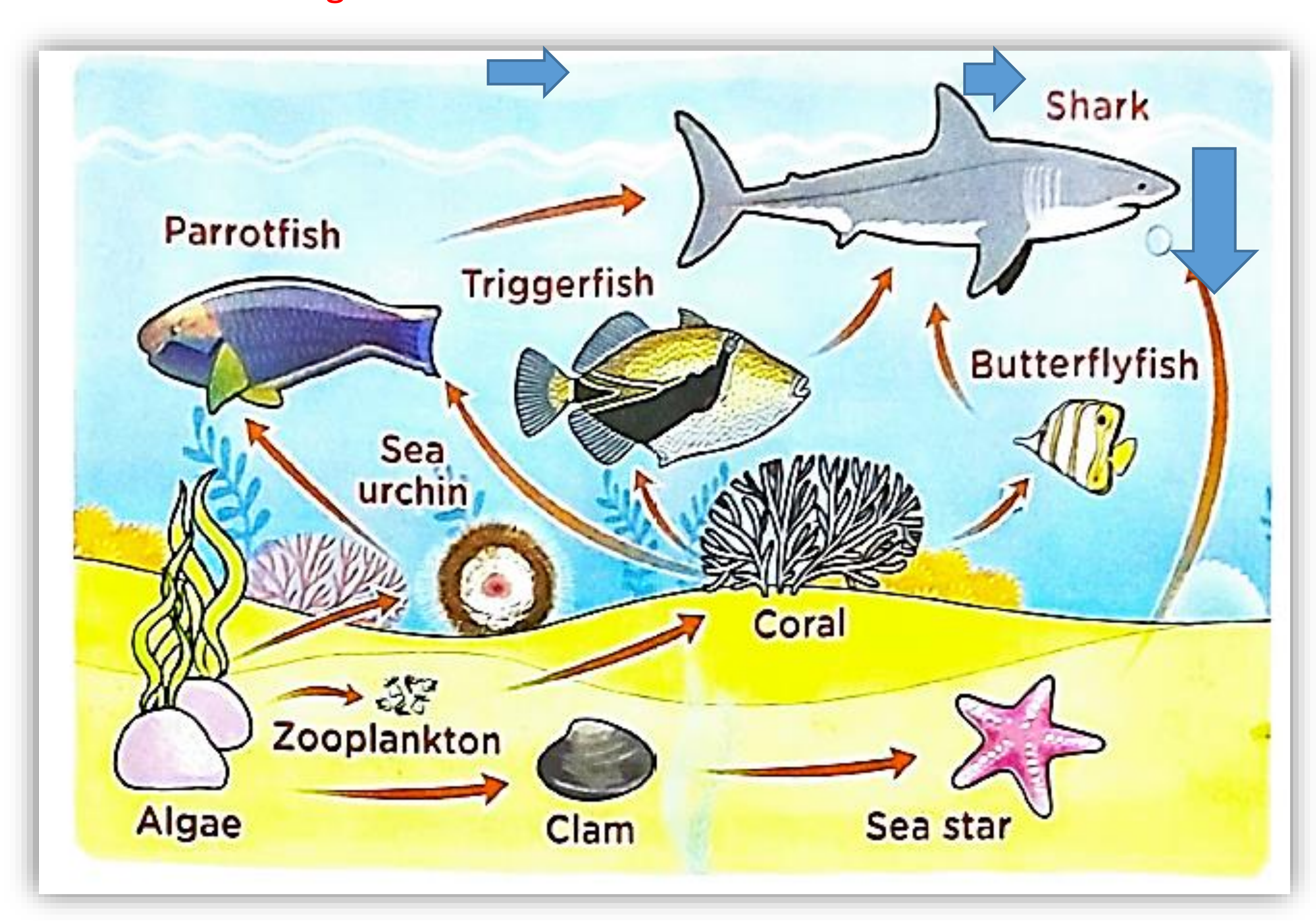
- Relationships between organisms in an ecosystem play an important role in keeping this ecosystem balanced.

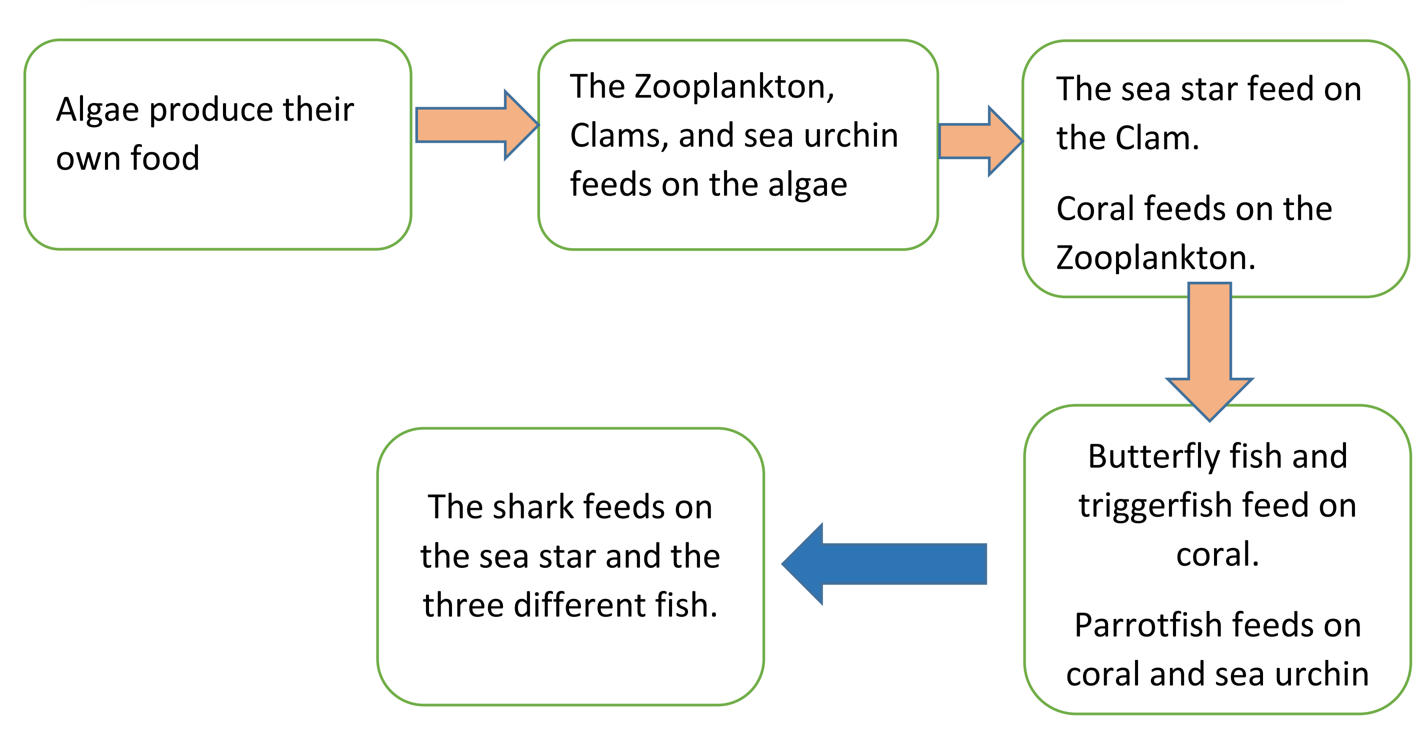
What happens if ……….?	Result	Reason	Picture
There is a gentle rain in the desert.	The desert ecosystem may be improved	Because the rainwater will feed the plants.	
There is a heavy rain in the desert.	The desert ecosystem may be harmed	Because heavy rain will cause flooding.	
There is a drought.	The food web in an ecosystem may be destroyed.	Because the plant will die, and also the organisms will die.	
There are many top predators.	The other organisms in the food web may be harmed.	Because the top predators will eat all organisms.	

Top predators: They are predators that exist on the top of food chains, such as: lions, tigers, sharks, etc.……

Food web

Look to this marine food web then observer which organisms eat other organisms.





Worksheet

1 Choose the correct answer:-

1- The sun provides the earth by ………………

a. light only b. warm only
c. light and warm c. light and sound

2-All of the factors pollute the water, except……….

a. sunlight b. animal wastes
c. human wastes d. plastic garbage

3-If the amount of grasses increases in an ecosystem increases, this directly increases the number of ………………

a. Caracals b. Hawks
c. lions c. Rabbits

4-All of the following are affected by water pollution, except ………

a. the soil b. animals
c. the sun c. plants

5-All of the following are top predator, except ………………

a. Hawks b. butterflyfish
c. lions c. Tigers

6-The marine food web usually started with …………….

a. Clam b. algae
c. zooplankton c. parrotfish

7- When there is a gentle rain in the desert, this ecosystem may be …

a. Harmed b. destroyed
c. improved c. collapsed

2 Write the scientific term :

1- It is the harms that happen to water and soil duo to human activities. (…………………)

2-They are consumers that exist at the top of food chain (………………..)

3 Give reason:

1- When the numbers of one species of consumer increases, they will die.

……………………………………………………………………………………………

2-Death of algae may lead to moving sharks away to another places.

4 Study the following food chain in an ecosystem, the answer:



Grass



Rabbit

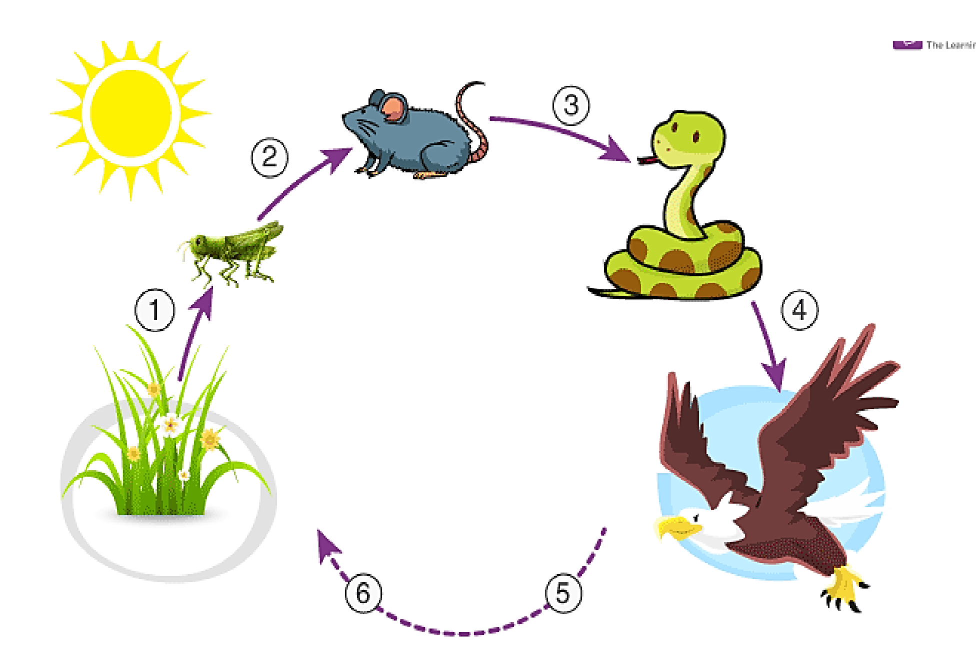


Fox

Situation	Results
1- The number or rabbit increases	The amount of ………… decreases. While the amount of ………… increases.
2-the amount of grasses …………… and the number of foxes ……………	The number of rabbits increases.
3-All ……………. disappear	All foxes are move away to another ecosystem to search for food.

Lesson (2)

Energy flow body model



1. The ………………. Represents the primary resource of energy.
2. The …………………..represents primary consumers.
3. The ……………………. represents secondary consumer.
4. The ……………………… represents tertiary consumer

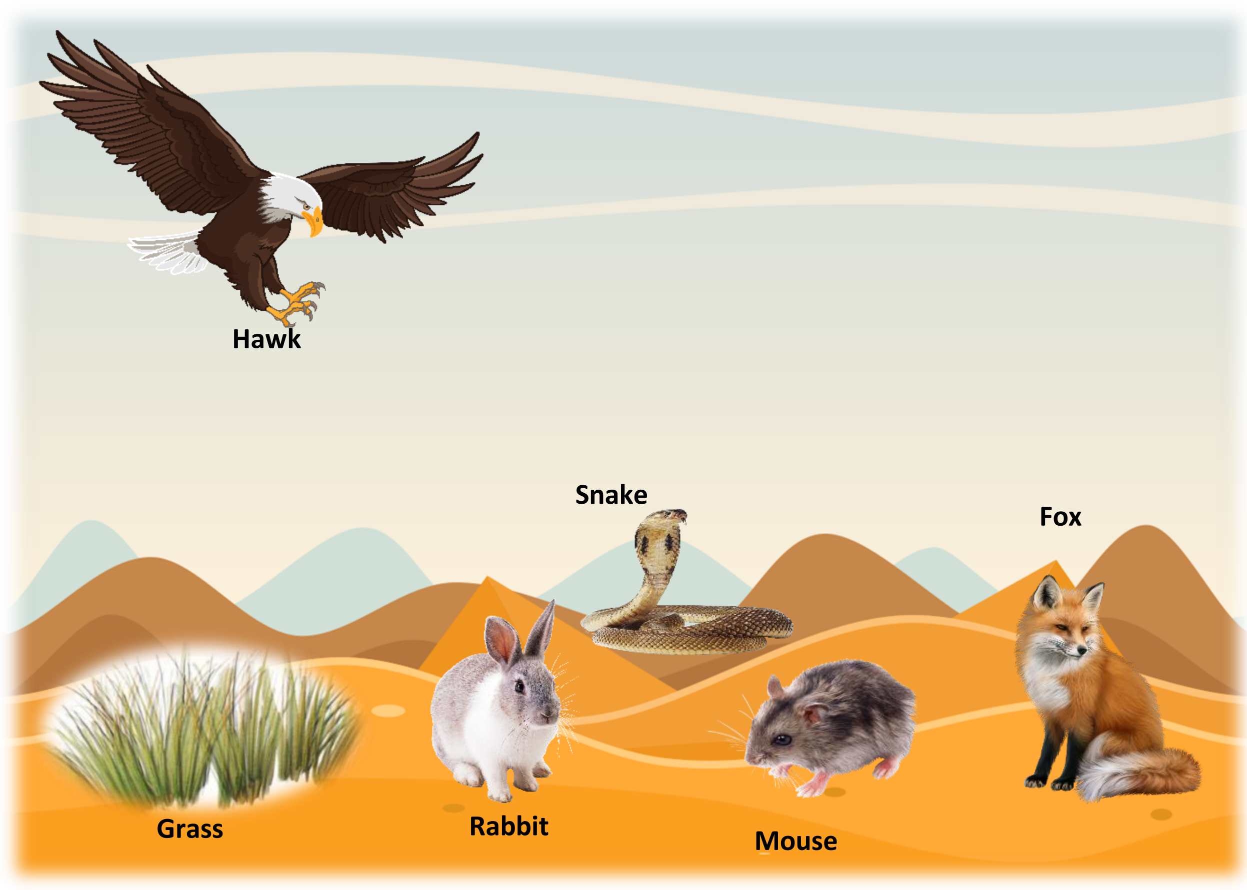
Note:

- The energy in overall system remains as the same where:
- 10% only of this energy transfers between living organisms when an organisms feed on other.

  90% of this energy left to decomposers, which return this energy back to the soil

Desert food web

Look to this desert web and draw the arrows that show the flow of energy.



Number of lines	Direction of arrow
2 blue arrows	Comes out of grass.
1 green arrows	Goes to the snake.
3 red arrows	Goes to the fox
3 black arrows	Goes to the eagle.

Look to the following pictures then answer:



Living organisms in the forest are not affected by wildfires.

(   )

Marine organisms are negatively affected by leakage of oil into the water.

(   )

❖ Fire in the forest produces **smog** and **ashes** which affect the organisms and causes difficulty in breathing.

Population Changes

There are many factors affect the environment such as :

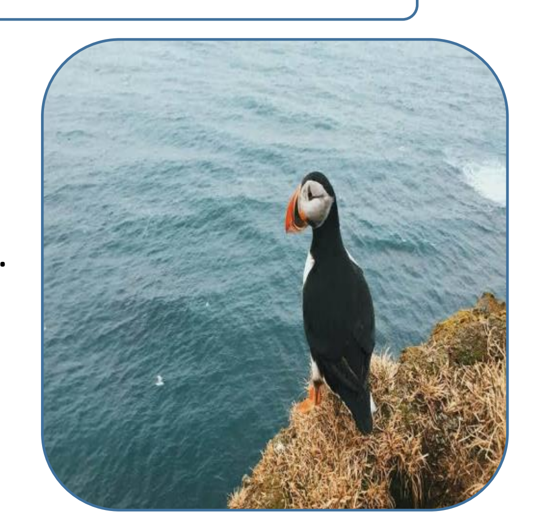
1- Increasing or decreasing the amount of water and temperature.

2- Climate changes.

These factors affect the number of organisms of one type of species. **(Population)**

Population: **It is the number of organisms of one type of species.**

Examples of living organism which are affected by climate changes



❶ Seabirds

- They build their nest at the top of mountains cliff.
- They feed on small fish.
- The small fish feed on the microorganisms that float on the water surface.

❷ Microorganis



- They are very **small** organisms which we can't see by our naked eyes.
- They can make their own food. (Producers)
- They are found in **cold** water habitat as they need this water to survive.

What happens to the microorganisms if the climate is changed?

Microorganisms will move to a place with



The small fish that feed on microorganism will also move.



Some seabirds will move to another habitat, and some will die.

Worksheet

1 Choose the correct answers:

1-Fire in the forest produces…………..

a. smoke only
b. ash only
c. smoke and ash
d. oxygen and ash

2-If the climate change is suitable, the population of a species ………..

a. will die
b. will not be affected
c. will increase
d. will decrease

3-Seabird build their nest ……………….

a. on the water surface
b. on the mountains cliffs
c. deep down into the sea
d. deep down into the river

4-The suitable environment of microorganisms to survive is ……….

a. hot water
b. warm water
c. cold water
d. boiled water

5- All of the following statements are correct except……

a.small fish can eat seabirds
b. sharks can eat small fish
c. small fish can't eat seabirds
d. seabirds can't eat sharks

2 Put (v)or(x):

1- Forest fire negatively affects the marine organisms. (   )

2- Pollution affects both of food resources and animal habitats (   )

3. Forest fire produces smoke only that covers the grasses. (   )

3 What happens if … ?

1. The climate change is unsuitable for a population of one type of species.

2. The seawater becomes warm

4 Write the scientific term of each of the following:

1. They are consumers which feed on secondary consumers **(……………………)**
2. They are living organisms that include bacteria and fungi, which return energy back to the soil. (……………………)
3. it transfers between animals in a food web, to help them do their activities and survive (……………………)
4. It is the number of organisms of one type of species. (…………………)
5. They are organisms that are too small for people to see with only their eyes. (…………………)
6. Flying living organisms that build their nests on the top of mountain cliffs and dive deeply into the sea to eat (……………………)

5 Complete the following sentences:

1. When food resources and animal habitats are affected by pollution, many ………………are negatively affected also.

3. Forest fire produces ……….that causes difficulty breathing for animals.

4. If the climate change is suitable, the population of a species will …

5. A predator get………………from the prey which feed on.

6 Give reasons for:

1. Food webs can be destroyed due to pollution.

………………………………………………………………………………………….

2. In case of fire forest, animals suffer from difficulty breathing.

Lesson 3

Habitat loss

The Marine living organisms need a healthy habitat to survive as clear water, food, and shelter.

- The human activities can affect this habitat which leads to increasing the temperature of the oceans that cause death and extinction of many organisms.

Examples: -

Coral reefs



- They are some of the most diverse ecosystems.
- They provide food and shelter for many fish and marine organisms.

Coral bleaching

When the water is very warm, coral reefs get rid of the algae living in their tissues.



This causes the coral reefs turn completely into white



As a result of coral reefs bleaching, they often don't survive.



Fish and other marine organisms that depend on coral reefs for food and shelter may die or move to another habitat.



Plastic pollution

Plastics in the sea affect marine life, where whales, sea turtles, seabirds and fish cannot often differentiate between real food and plastic.

Examples of the effect of plastic pollution

(1) Sea turtles

Sea turtles can't differentiate between a jelly fish and a plastic piece, so the sea turtles eat a lot of plastics and get harmed



(2) Coral reefs

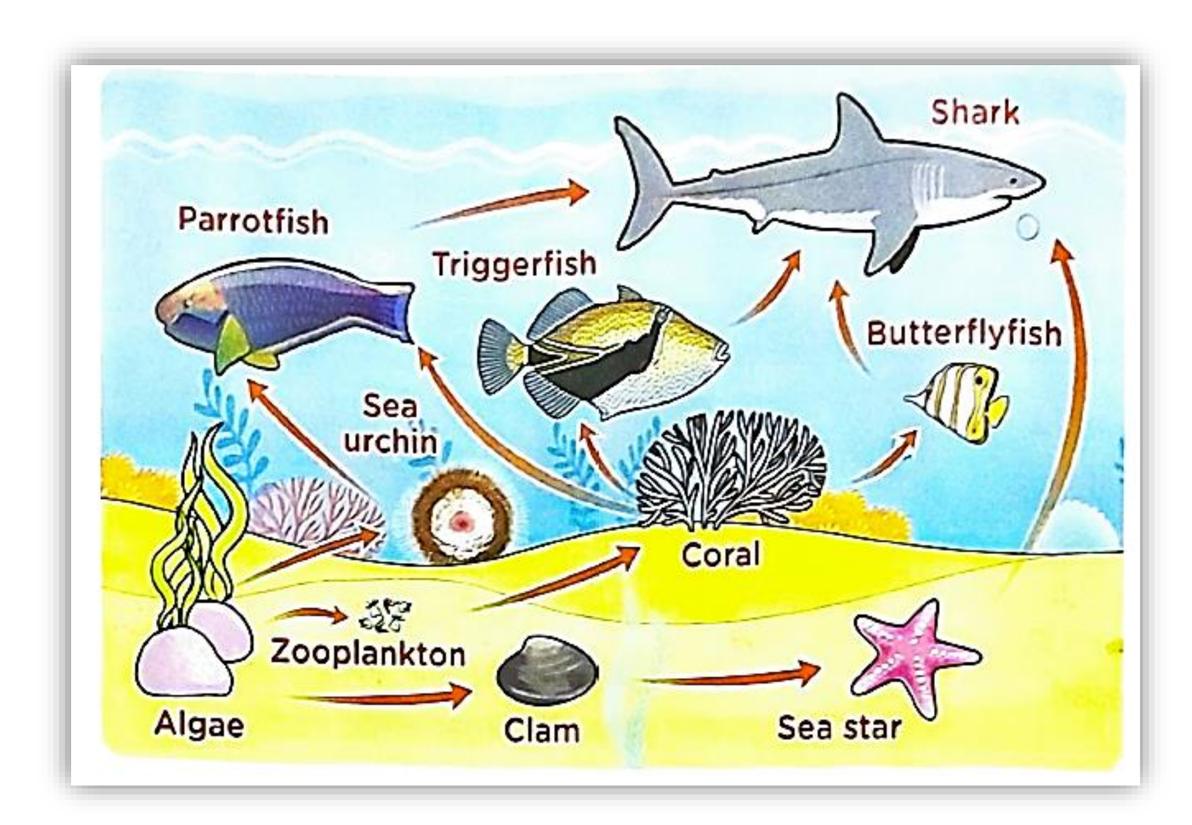
Due to the effect of **UV** rays coming from sunlight, plastic products get broken down into smaller pieces called **(Micro plastics) , which are smaller than rice grains.**

When coral reefs filter the seawater to get their food, they ingest these Microplastics, so they get harmed.



What happens if coral reefs disappeared?

- Organisms that depend on coral for food and shelter will die
- The parrotfish, tigerfishes and butterflyfish will have nothing to eat.
- The shark will find a small amount of food to die, so they may die.
- The algae that live in the coral tissues will lose their habitats



What happens if many plants near to river are removed?

The riverbanks erode, so floods may reach to farther areas.

Worksheet

1 Choose the correct answer:

1. Healthy marine environment is important for survival of …….

a. humans. b. lions c. deer d. fish

2. All the following are healthy resources for the marine food web, except ……………..

a. clean water and food

b. clean shelter and food

c. clean shelter and water

d. polluted water, food and shelter

3. When the marine habitats are destroyed, the number of living organisms in their food web is ………….

a. increased. b. decreased. c. not changed. D. doubled

4. All the following may occur due to habitat loss except

a. increasing of population. b. decreasing population.

c. extinction of some organisms d. decreasing of resources.

5. Coral reefs are considered as………………

a. living organisms. B. bacteria c. ecosystems. d. fungi

6. When water temperature increases, algae leave tissues of ……………so they become bleached.

a. seabirds b. coral reefs c. clam d. sharks

7. As a result of coral reefs bleaching, they will be ……….

a. increased b. enlarged. c. survived. d. died.

8. Plastic waste materials cause all the following to the marine environment except …………

a. breakdown in food webs.   b. pollution of water,

c. increasing of population.   d. decreasing of population

2 Complete the following sentence by using these words.

(extinction - overfishing - shelter - toxic - predator)

1. Healthy natural resources include clean air, healthy food, and water and suitable ………….
2. The human activity that directly decreases the marine population is ………………………….
3. Habitat loss is not only decrease marine population but also it is one of the main causes of ………………………
4. When a sea turtle eats a jellyfish, this means that the sea turtle is a ……………… living organism.

3 Give reasons for:-

1 coral reefs are Important for human communities.

2. Coral bleaching happens when the water temperature

4 Write the scientific term:-

1. It is a condition in which coral reefs turn completely into white. (………………………)

2. They are rays coming from the Sun that break down plastic products into micro plastics. (………………………)

3. Small pieces of plastics in the size of rice grains and they cause harms to marine organisms. (……………………)

Lesson (4)

Habitat Restoration

Habitat Restoration

- It is the process of returning a habitat (an environment) back to its natural state before harm was done.

Example of habitat restoration

Rebuilding of coral reefs

"Coral reef rehabilitation project" that happens in the Arabian Gulf, where:

- Scientists collect small parts of different coral species and then move them to a "nursery"

Nursery: It is an area in the sea where scientists take care of small pieces of coral reefs until they grow up and can be moved back to the reefs.



- The world- famous coral reefs of red sea must be protected by applying a new way called Zero plastic, so :

People should:

- recycle the plastic products instead of throwing them in the sea

- replace the plastic forks with wooden ones.

- replace the plastic bags with cloth ones.



Model exam

(1) (A) Choose the correct answer:

1. All the following factors pollute the water, except ………

a. plastic garbage. d. humans wastes

b. animals waste d. sunlight

2. in the food chain, the energy transfers……………….

a. from consumer to a producer

b. from a predator to a producer.

c. from a predator to a prey

d. from a prey to a predator.

3. Seabirds build their nests

a. on the water surface. b. deep down into the sea.

c. on the top of mountain cliffs. d. deep down into the river.

4. As a result of coral reefs bleaching, coral will be

a. increased. b. enlarged. c. survived. d. died.

5. When water temperature increases, algae leave tissues of , so they become bleached

a seabirds b. coral reefs c. clam d sharks

6. Plastic waste materials cause all the following to the marine environment, except

a. breakdown in food webs. b pollution of water,

c. increasing of population. d. decreasing of population.

(B) What happens if...?

The number of secondary consumers in an ecosystem decrease.

…………………………………………………………………………………

(2) (A) Write the scientific term of each of the following.

1. It is an area in the sea, where scientists take care of small pieces of coral until they grow up. (……………………….)
2. Small pieces of plastics in the size of rice grains and they cause harms to the coral reefs. (…………………….)
3. It is the number of organisms of one type of species living in an area. (…………………….)

(B) Correct the underlined words:

1. Due to rising of water temperature, coral reefs turn completely into **green**
2. Producers need the energy of **moonlight** to make photosynthesis process.

(3) (A)Complete the following sentence using these words •

(marine environment - ecosystem - shelter)

Coral reefs are considered as an ………..that supply food and ……….. for many living organisms which live in……………….

(B) Give reason:-

1. Coral bleaching happens when the water temperature rises.

……………………………………………………………………………..

2. When the number of one species of consumers in an ecosystem increases, they will die
3. Food web can be destroyed due to pollution. ………………………………

(C) Form a food chain by using the following living organisms:

(Lion - Grasses - Deer)

Theme 2

Unit 2

Particles in motion



Matter

- Everything around us is made of matter such as plant, human .air and water.

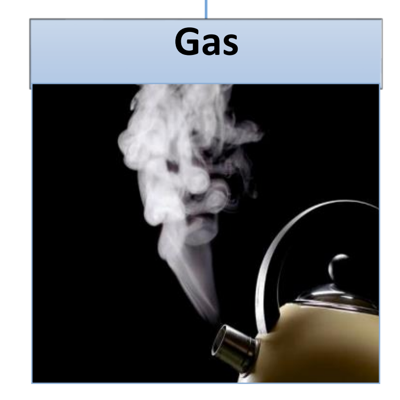
Matter

- It is anything that has a mass and takes up space.(Volume)



States of water

3 states

Soild	Liquid	Gas
		
Ice cubes	Water flowing out of the tap	Steams(water vapour)

Matter changes from one form to another by heating or cooling

Ex

Water → Heating → **Water Vapor**

Worksheet

(1) Choose the correct answer

1-Matter can be found in ……………….states.

a. 2 b. 3 c. 6 d. 7

2- Water can be found in a solid state in the form of ………………..

a. ice b. steam c. sea water d. boiling water

3-An example of gas is ………….

a. Chocolate b. rock c. pencil d. oxygen

4-All of these substances are liquid, except …………….

a. oil b. milk c. stone d. vinegar

5-Both ………….and ……………. have the same state of matter.

a. wood-water b.plastic- oil c.wood- milk d.wood –plastic

---

(2) Choose from column (B) what suits it in column (A)

(A)	(B)
1. Carbon dioxide 2. sand 3. Gasoline	a. is not a matter b. is a liquid matter c. is a gas matter d. is a solid matter

(3) Give reasons for:

1- Salt is a matter

…………………………………………………….

2-Rubber differs from iron.

…………………………………………………………………..

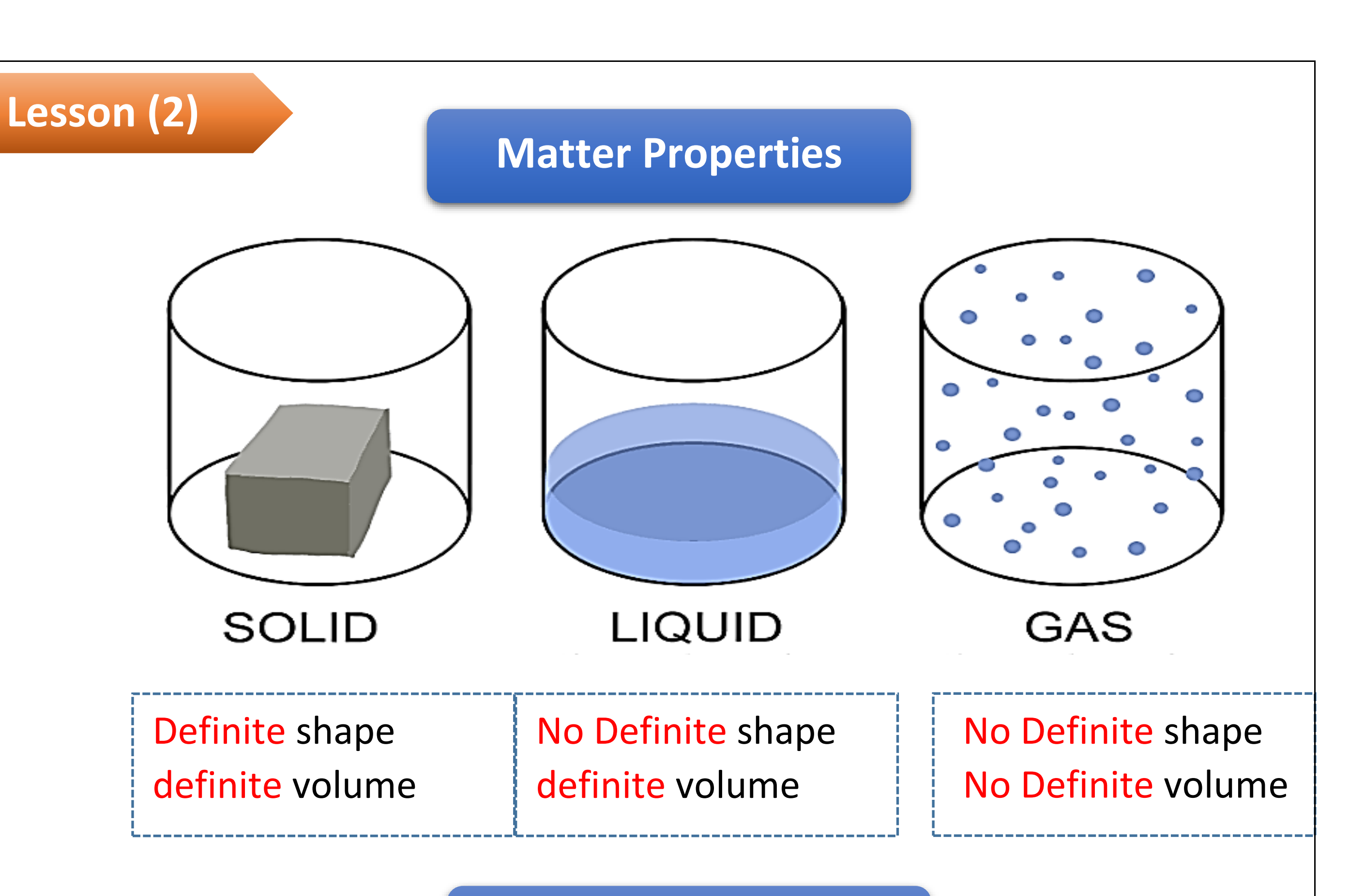
(4) What happed if ….?

Water is heated in the kettle for few minutes.

…………………………………………………………………………

Lesson (2)

Matter Properties



Particles of the matter

- Particles: The building unit of matter.
- We can see the particles by using regular microscope.

Particles of solid matter	Particles of liquid matter	Particles of gases matter
1. They are very close to each other (Packed tightly) 2. They have less energy 3. They move little bit.	1. They are very close to each other (Packed tightly) 2. They have more energy 3. They can move more freely.	1. They have a lot of spaces. 2. They have a lot of energy. 3. They move very freely

Measuring and observing matter

1- The length Measured by → Ruler or measuring tape

2- The mass Measured by → Scales



2- The Temperature Measured by → Thermometer

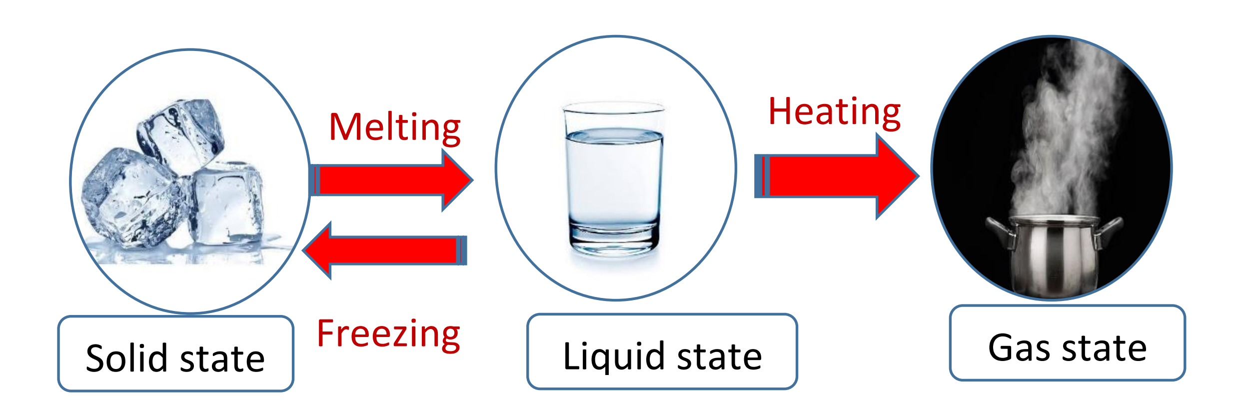


Notes:

- ✓ Matter can change from solid to liquid state through Melting.

  Or

- ✓ From liquid to solid state through Freezing



Worksheet

1 Choose the correct answers:

1-Bricks are considered ……………………………matter.

a. solid b. liquid C. gas d. plasma

2- We can measure the mass by using …………………..

a. scales b. thermometer C. ruler d. tape

3-…………… state(s) can be poured.

a. Solid and liquid b. Liquid only C. Gas and liquid d. Gas only

4-Liquids have definite …………, but their …………. are not definite.

a. Volume-shape b. Color - volume C. Color-shape d. Shape-volume

5-Both of ……………….and ………………….. take the shape of their container.

a. air-plastic b. water--air C. wood-air d. Water-plastic

6-Particles of ………………. are very close to each other.

a. gold b. milk C. steam d. oxygen

7- To measure the temperature of a table, we can use a ……………….

a. Thermometer b. Measuring tape C. scales d. cylinder

2 Give reason:

1-Suger is a solid matter. ………………………………………………………………….

2-Oxygen has no definite shape or volume. ……………………………………….

3 Complete the following:-

1. States of matter are .... ,.........and gases.
2. In the matter, the volume and shape don't change.
3. Water is a matter in ....state, while water vapour is a matter in state.
4. Matter that takes the shape of its container, but its volume cannot be changed is
5. The……………of a pen can be measured by using a ruler.
6. Particles of .... matter are very close to each other.

4 Write the scientific term:

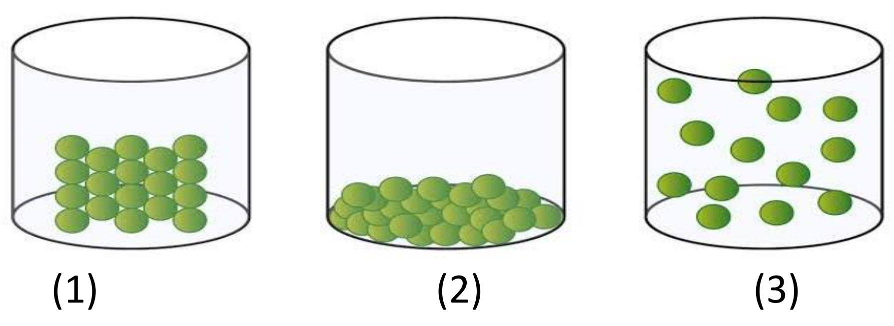
1-The state of matter that has definite shape and volume. (……………….)

2-The state of matter that is characterized by having a definite volume but it doesn't have definite shape. (……………….)

3-The substance that takes the shape and volume of container. (…………)

4-The tool used to measure the length of a wall. (………………..)

5 Study the following figures then answer.



(1) (2) (3)

1- Figure (1) represents ………….matter.

2-Figure (2) represents ……………………. Matter

3- Particles of figure ………………… moves very freely.

Lesson (3)

States of matter

The shape of solids matter	The shapes of liquids matter	The shapes of gases matter
They have definite shape Their shape don't change unless something is happening to change them. Solid	They don't have definite shape They take the shape of containers. Liquid	They don't have definite shape They fill their containers and take their shape Gas

Matter is something we can:

1-See ------------→ex (Ball)

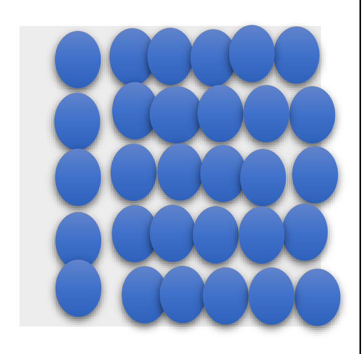


2- Feel ------------→ex (Air)

3- Smell ------------→ ex (Flower)

Any matter is made of <u>tiny particles</u> which we can't see it by our eyes.

Particles of the solid

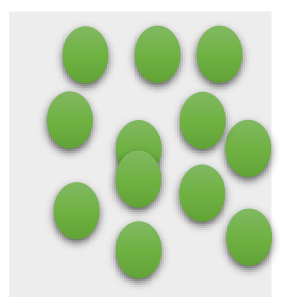


They are packed closely so:

1-They vibrate round their space

2-They can't move from one place to another.

Particles of the Liquid

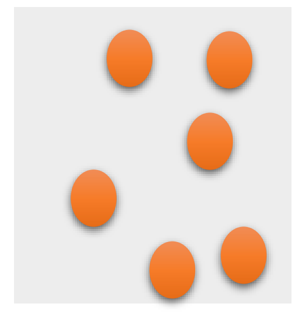


They are held together, so:

1-They move faster than solid particles.

2-They can slide over each other so, they take the shape of their containers.

Particles of the gas



They are not held together, so:-

1-They move very quickly in all direction.

2-They can spread out to fill any container.

Worksheet

1 Choose the correct answer

1-The shape of. …………………is fixed as it is a ……….. matter.

a. gold-liquid b. water-liquid c. gold-solid d. air-gas

2. Oil takes the ………..…of its container

a. volume b. shape c. color d. mass

3. If we pour an amount of milk from container to another one has a different shape, so the shape of milk will ……….and its volume will ………..

a. change-change ' b. not change- not change

c. change-not change d. not change- change

4.. Particles of …………… vibrate around their place

a. glass b. air c. oxygen d. water

5. The movement of particles of water are slower than that of……….

a. wood. b. plastic. c. air. d. gold.

6. The liquid matter is characterized by all the following, <u>except</u> that

a. its particles move faster than solid particles.

b. its particles move slower than gas particles.

c. its particles can't spread to fill up any container they put in.

d. its particles are held together more closely than solid particles.

---

2 Write the scientific term

1. A state of matter that has a fixed shape. (…………………….)
2. The building units of matter (…………………….)
3. A device used to examine objects that are too small to be seen by naked eyes. (……………………)

4. A state of matter that its particles vibrate around their place. (………………)

5- A state of matter that its particles moves faster than solids and have a definite volume. (……………….)

3 Complete the following sentences:

1. Any matter is made up of millions of tiny ……………………that we can't see it by our naked eyes.
2. The shape of ……………..matter doesn't change unless something is happening to change it.
3. The particles of …………. matter are packed closely together.
4. Particles of liquid matter can move more faster than………………matter and more slower than ………………..matter.

4 What happens if… ?

1. Water changes into ice. ………………………………………….
2. A liquid changes into gas…………………………………………
3. We try to examine the particles of any substance with our naked eyes. ………………………………………………………………………….

5 Give reasons for:

1. Air has no definite shape or volume.

…………………………………………………………………………

2. Particles of gases can spread out quickly to fill up any container they put.

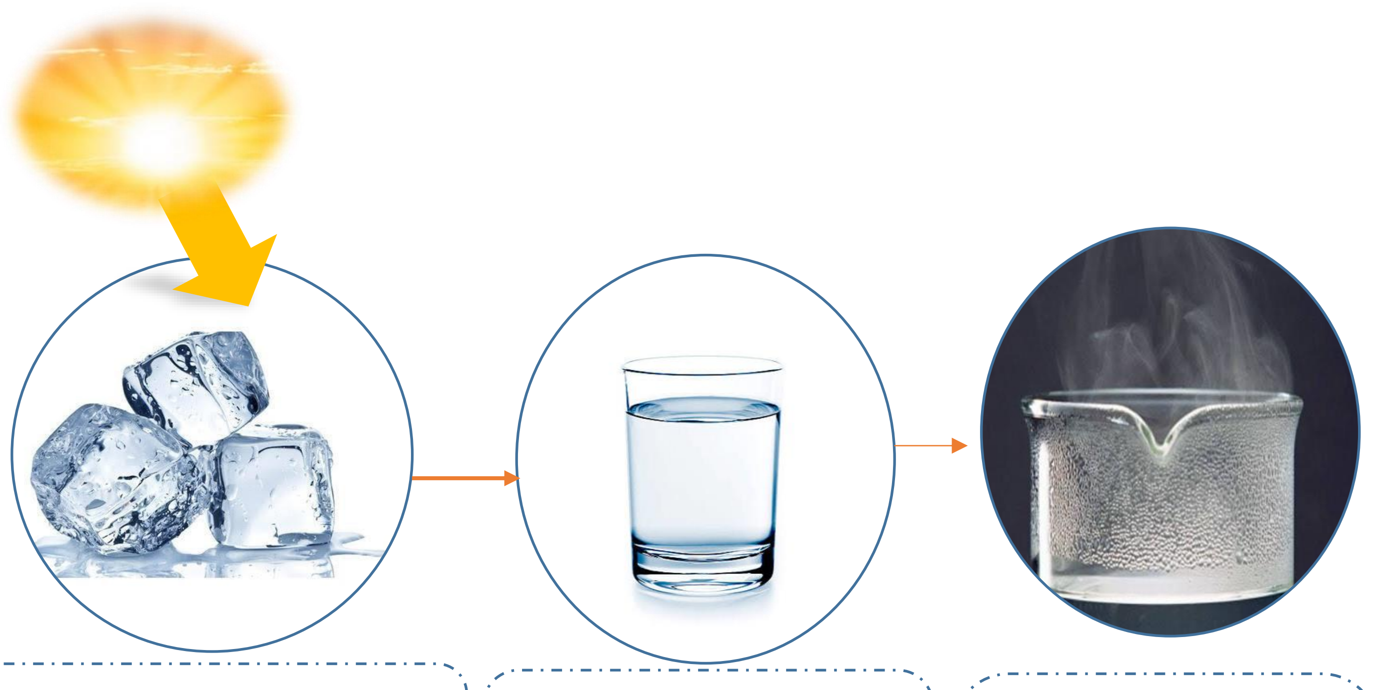
Modelling the particles of matter

- What will happen when you leave the ice cream out of the fridge?

Ice-cream will remain as it is. ☐

Ice –cream will turn into liquid. ☐

- What happen when the ice cubes exposed to the sun ?



The sun will heat up the particles of ice cubes

1

The particles of ice cubes move faster and turned into liquid

2

The sun heats up the particles of water so they move faster and water will evaporate

3

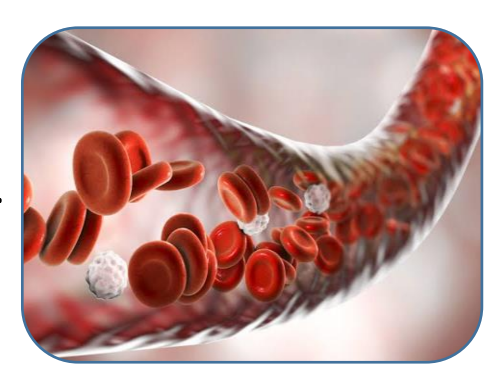
The Particles Size

Tiny Particles Size

The size of particles depends on:

1- The type of particles.

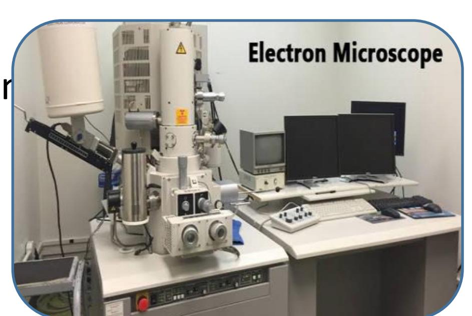
2- How particles connected with each other.



Blood cells

1 hair has (150,000 to 300,000) particles.

- To see the component of one particle such as one blood cell you must use **electron microscope** not regular microscope.



electron microscope

- **How can you show that the particles exist?**

When you blow up a balloon	When you squeeze a balloon
The particles of air moves very quickly and hit the balloon from inside The balloon inflates	The particles come close together, and balloon becomes smaller.

Worksheet

1 Choose the correct answer:

1-By changing the ……………. of matter , its state may change.

a. mass b. volume c. color d. temperature

2- By blowing up a balloon …………………

a. its volume decreases c. its volume increases

b. its color changes d. its mass doesn't change

3- Particles of ……………….are close to each other, but they can slide and flow over each other.

a. glass b. air c. water d.iron

4.To examine the structure of tiny particles of matter , we can use…………

a. balance c. rulers

b. microscope d. thermometer

2 Give reason:

1-Sometimes we need to use an electron microscope.

……………………………………………………………………………..

3 Write the scientific term:

1-The state of water after its heating for high temperature. (……………)

2-The device used to examine one tiny particles such as one blood cell.

(………………)

4 You have a ping pong balls, complete the following designs by using the balls :

Solid state

Liquid state

Gas state

---

5 Compete the following:

1-When an ice cube is exposed to the sun, the speed of movement of its particles will …………………..

2-Water evaporates when it is exposed to a …………………temperature.

3- Scientists can't use the ………………… microscope to see the components of one blood cell.

Lesson (4)

Models

❖ Models help us to understand things we cannot easily see such as, earth, solar system and germs.

Model

- It is a copy tht is similar to a real thing.

Examples of models

1-Globe (A model of the earth)

It shows us:

1. The shape of the earth.
2. The water that coves the earth.
3. Where different countries are located



Globe

2- Solar system

It helps us:

1. See all planets at once.
2. Compare between the sizes of planets.



3- A germ Model

It helps us:-

1. See the shape of germs without microscope.
2. See different parts of germs.



4- A volcano Model

It shows us:

1. The shape of volcano.
2. How the liquid comes out of volcano during eruption.



5- A Model for airplane

- It shows us how it flies up into the air.



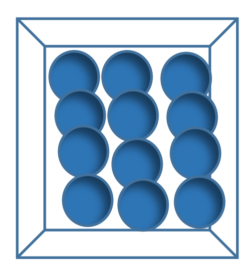
Models help us

✓ Teach something about the real things they copy.

✓ See and understand how things work.

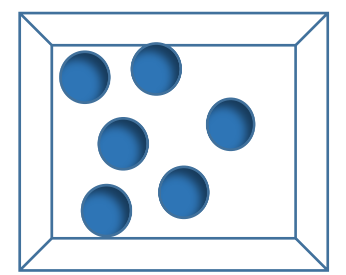
✓ Know what we could not see.

Modelling states of matter.



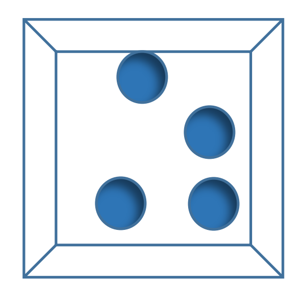
Solid matter

They have organized pattern



Liquid matter

They have a random arrangement



Gas matter

They have a random arrangement

(Not organized at all)

Worksheet on lesson 5

1 Choose the correct answer-

1. The model of the Earth shows how much of its surface is covered with ……………….

a. gasoline b. water c. milk d. animals

2. We can see all planets of the ……………… system including the Earth by using a model

a- solar b. digestive

c. respiratory d. muscular

3. Some liquids come out of a……………… during eruption.

a. star b. wooden piece c. volcano d. plastic piece

4. Particles of …………..are organized and have a regular pattern

a. solids only b. solids and liquids

c. gases only d. liquids and gases

5. Gases differ from solids and liquids in that gases……………….

a. can be poured. b fill any container they are put in

c. have a definite shape. d. have a definite volume.

2 Put √ or ×

1-Models help us understand things that we can easily see with our eyes. ( )

2. Solar system contains only one planet which is the Earth. ( )

3. Models help us understand ideas, objects or processes. ( )

3 Write the scientific term

1. A model of the whole world that is made in the shape of a large ball (……………………)

2. A copy that is similar to a real thing which we cannot observe with our eyes. (………………)

4 Complete the following sentence between the brackets:

1. Particles of ……………… are moving very fast (Oxygen- Water)

2. The substance is transformed from a solid to a liquid by …………….. (heating – cooling)

3. ……………help us to see things that are hard to be seen, either big or small things. (Lenses- Models)

---

5 Give a reason for:

- Both liquids and gases don't have a definite shape and take the shape of their containers.

……………………………………………………………………………………………

……………………………………………………………………………………………

6 What happens to ……?

The arrangements of particles of water after its freezing.

……………………………………………………………………………………………

……………………………………………………………………………………………

Lesson (5)

STEM in Action

States of matter in the kitchen

We use the three states of matter to prepare and cook different types of food such as:

Solid matter	Liquid matter	Gas matter
• Rice • Pasta • Frozen vegetables	• Water • Oil • vinegar	• Natural gas used in the oven. • Steam of boiling water.

Scientist Chef

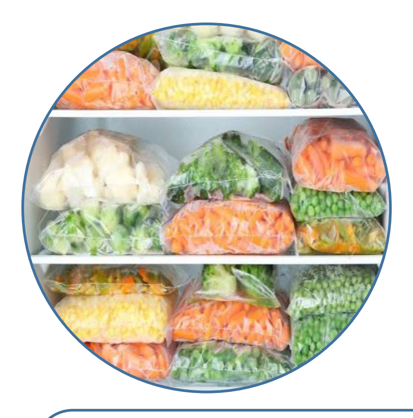
- Chef use different state of matter in their kitchen

Examples:-

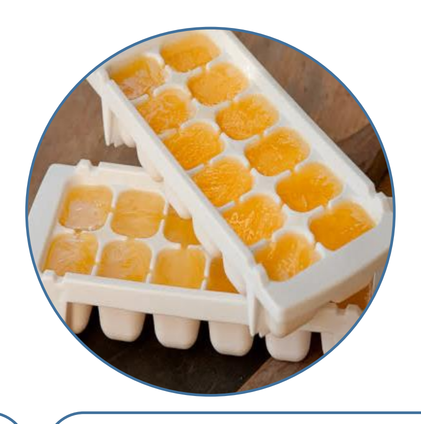


Cooking pasta

(Water boils and releases steam)



Freezing vegetables and fruits.



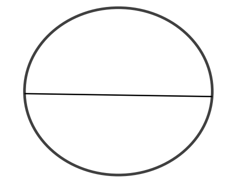
Freezing orange juice

(Liquid to solid state)

Point of comparison	Particles of solid matter	Particles of liquid matter	Particles of gas matter
Spaces between particles :	Very close together	They have more spaces but still held together.	They have a lot of spaces (not held together)
Energy of particles :	They have more energy.	They have less energy.	They have a lot of energy
Movement of particles :	They vibrate around their place.	They move faster than solid.	They move very freely in all directions.
Spreading of particles :	They can't move from one place to another.	They can slide over each other.	They can spread out to fill up any container.
Arrangement of particles :	Regular pattern(organized)	Random arrangement. (not well organized)	Random arrangement. (not organized at all)
Shape :	Definite shape	Not definite shape	Not definite shape

Model

- It is a copy tht is similar to a real thing.



Model exam on Concept 1.2

1- Choose the correct answer:

1-The particles of matter spread out freely in the ……….. state.

a. solid b. liquid c. gaseous d. all of the previous

2- Which of the following material has an indefinite shape and definite volume?

a. solid b. liquid c. gaseous d. all of the previous

3-The amount of space that a matter takes up is called ………….

a. mass b. volume c. area d. weight

4- Particles of ……………… vibrates around their place.

a. glass b. air c. water d. oxygen

(2) What happens to ……….?

1- The size of a balloon when you blow it up.

………………………………………………………………………………………

(3) Put √ or ×

1-Matter exists in only two states. ( )

2- Models help us understand things that we can easily see by our eyes. ( )

3-Light and sound are form of matter. ( )

(4) Write the scientific term:

1-The tool used to measure the length of a wall. (…………………)

2-The building unit of matter. (………………..)

3-The state of water after its heating for high temperature. (……………..)

A Roof for Every Type of Climate

Every building should have a roof, as roofs keep buildings cool and protect them.

The materials used in making the roofs are differ according to the climate, such as:-

	Material of the roof	Properties of roof material
Desert homes	Made of **strong stones**	- It is flat - It protects the home from dust and dirt.
Cold weather homes	Made of **ceramic tiles** (ceramic bricks)	- it is slanted(inclined) - It protects the home from rains. - Allow snow to slide over it.
Tropical rainforest homes	Made of **leaves and sticks**	- It is slanted - It protects the home from animals getting inside.

Describing Matter

Choose the correct word:-

Item	Property
1. Vinegar	It has (odor- no odor) and is found in (solid – liquid) state.
2. Sand	It has (powder- granular) texture. and (yellow-green) color
3. Marble	It has (rough- smooth) texture, and a (cone – spherical shape)

Measuring Matter

Temperature – Mass- Length – Volume of liquids

Measuring Tool	Property
1. Balance Scale	…………………..
2. Measuring Cup	…………………..
3. Thermometer	…………………..
4.measuring tape	………………….

Worksheet on lesson 1

1 Choose the correct answer

1. All of the following can be used to describe matter except………

a.shape b.price c.color d.texture

2. Which of the following homes have an inclined roofs?

a. desert homes only

b. Tropical rainforest homes only.

c. desert and cold weather homes.

d. tropical rain forest homes and cold weather homes.

3. We can identify milk by determining it's ……………………

a. color and texture b. shape and color

c. color and size d. color and taste

4. You can measure the length of your friend by using a ……………

a. thermometer tape measure c. balance d. measuring cup

2 Write the scientific term

1. A material that is used to build the roofs of cold weather homes. (………….)

2. A material that is used to build the roofs of desert homes. (……………)

3. The property of matter which is measured by the measuring cup. (……………)

4. The property of matter which is measured by the balance. (………….)

5. The property of matter which is measured by the tape measure. (……………)

Lesson (2,3)

The Case of kitchen Mystery

How can you differentiate between the following substances?



Sugar (Large crystals)

Salt (Small crystal

Flour (Very tiny crystals)

Unknown mixture

- All materials have the same color, but they have different texture.
- We can identify matter depending on its **physical properties** like (colour- odour- texture)

Properties of matter

1- Physical Properties

Physical properties

- Odor
- Colour
- Shape
- Texture

2- Chemical Properties

1-Ability to burn

Ex: Paper burning



2- Rusting



Ex: Iron Rusting

3- Mass and volume

Mass		Volume		
The amount of matter in an object.		The amount of space that matter takes up.		
Units				
Gram (g)	Kilogram(Kg)	Liter (L)	Milliliters (ml)	Cubic Centimeters (cm3
Measuring small masses Ex: Jewelry	Measuring large masses Ex: Fruits	Measuring Volumes of liquids	Measuring Volumes of liquids	Measuring Volumes of liquids or solids
1 paper clip = 1 gram 1 Kg =1000 gram		1 liter of water = 1 kilogram 1 L = 1000 ml =1000 cm^3		

4- Temperature

- ✓ Temperature is the measure of how quickly the particles in a substance are moving.
- ✓ Particles that move faster can give off more heat energy than slower ones.

Thermometer

Worksheet

1 Choose the correct answer

1. We can differentiate between salt and flour through all of the following properties except

a. shape of particles c. texture of particles

b. taste d. color

2. All of the following are physical properties of matter, except ……

a. color b. rusting c. texture d. shape

3. When iron interacts with water and air, it ……………….

a. becomes ash c. becomes powder

b. burns d. rusts

4. The volume of 1000 cubic centimeters of liquid is equal the same volume of ……………………….

a. 1 Kilogram b.1 gram c. 1 centimeter d. 1 liter

5-All the following properties of matter can be measured by different tools except …………

a. mass b. volume c. color d. temperature.

2 Put √ or ×

1. Salt and sugar have the same color and odor. (   )
2. We can differentiate between sugar and flour by texture only. (   )
3. Shape is one of chemical properties of matter. (   )
4. Burning of fuel is considered from chemical properties of fuel. (   )
5. All physical properties of matter can be measured. (   )
6. When we put an iron nail in water and then leave it in air, it will rust. (   )
7.1 kilogram of water has a volume equals 1000 milliliters. (   )
8. The temperature increases by increasing the speed of moving particles of a matter. (   )

3 Write the scientific term

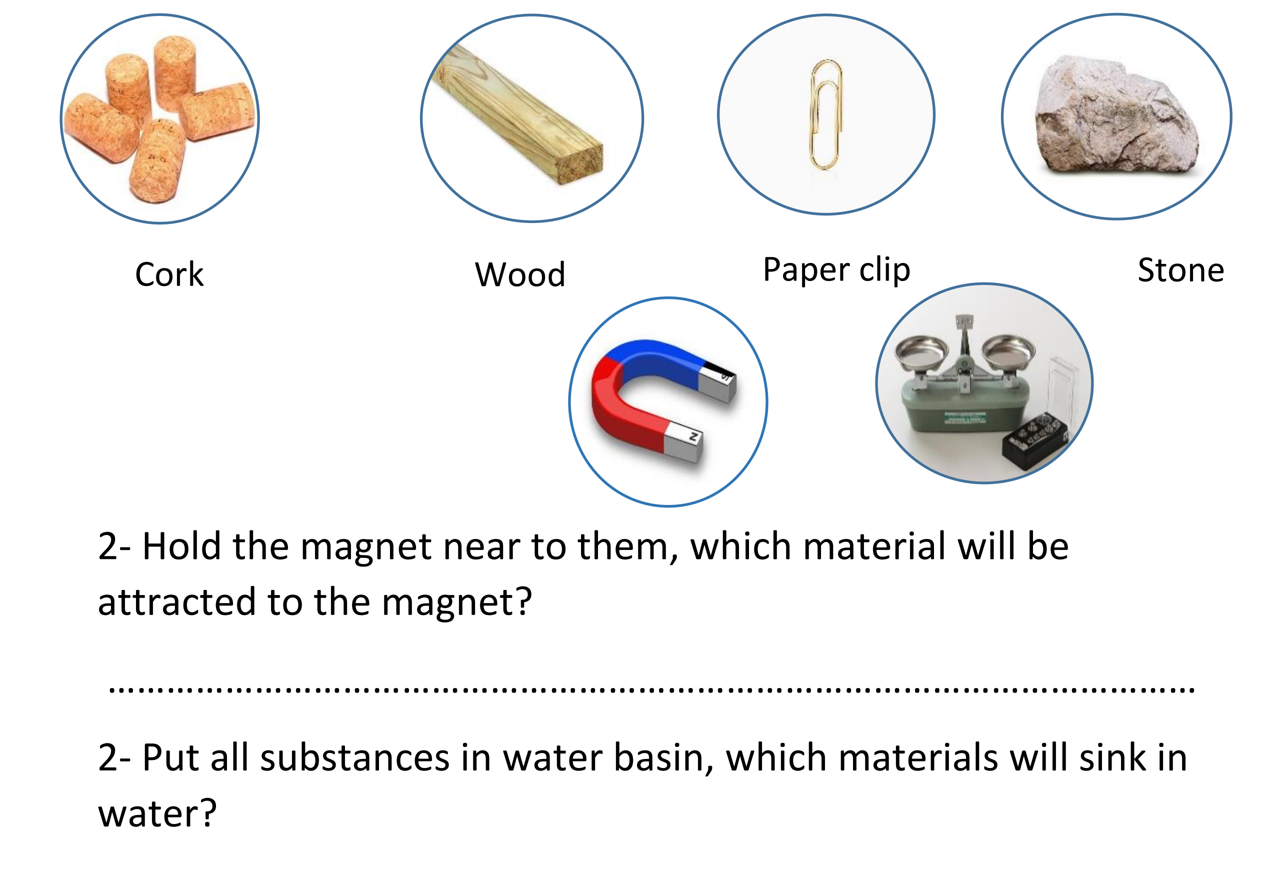
1. The properties of matter which you can observe them by using your five senses. (…………………)
2. The properties of matter which can be observed and measured by the changes that happen when the material interests with other materials. (…………………)
3. It is the amount of space that matter takes up. (…………………)
4. It is a measure of the amount of matter. (…………………)
5. It is a measure of how quickly the particles in a matter are moving. (…………………)

4 Give reason:

1- When the particles of a matter move quickly, its temperature increases.

Measuring Properties

1-Prepare the materials in the picture then measure the mass of each substance by using the balance.



2- Hold the magnet near to them, which material will be attracted to the magnet?

………………………………………………………………………………………………………

2- Put all substances in water basin, which materials will sink in water?

……………………………………………………………………………

3- which materials will float on water?

………………………………………………………………………………………

Does the shape and size affect the mass of material?

- Changing the shape of matter doesn't affect its mass
- When cutting an apple into half, its mass will decreases to half.

3 gram  =  3 gram

Measuring Matter

Ahmed measured several objects and recorded his measurements in the table below.

Measured Property	Object (1)	Object (2)	Object (3)
Mass (g)	189	150	99
Length (cm)	37	55	23
Volume (ml)	100	115	5

Based on the data in the table, choose the correct answer:

1. (Object 1 – object 3) ....contains more matter than object 2.
2. (Object 2 – object 3)......................is longer than object 1.
3. (Object 2– object 3) .... takes up more space than object 1 .

Examples:

Empty milk cartoon and baseball



The empty milk carton has more volume but less mass



The baseball has less volume but more mass

Lesson (4)

Useful properties of matter

1- Helium

Physical properties

- It's a gas
- It is lighter than air, so it rises up.

Chemical properties

- It is not poisonous.
- It is not flammable

Uses of helium

It's used in flying balloon and blimps

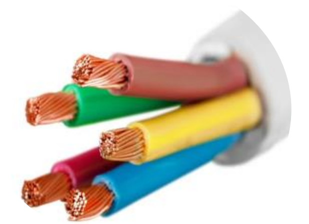


2- Copper

Physical properties

- It can be stretched into thin wires.
- It conducts electricity and heat .

Uses of copper



Electric wires



Cooking Pans

The following table shows some uses of some matter and its properties.

Types of Matter	Uses	Property
Steel	Screwdrivers, Hammers	• Hard. • Strong.
Glass	Windows, Eyeglasses	• Transparent. • Smooth.
Rubber	Athletic shoes, gloves, Tires	• Water proof. • Flexible.

Note:

Conduction: The ability of material to transfer heat and conduct electricity.

Worksheet

1. Helium is lighter than the air, this property is considered as ……………

a. a physical property only

b. a chemical property only

c. both physical and chemical property.

d. Neither physical nor chemical.

2-When you put a lighting match close to helium gas, it will ………….

a. burn b. not burn c. form fire d. freeze

3-steel is used in making hammer because it is ………………….

a. smooth b. flexible c. hard d. transparent

4. Glass is transparent, so it can be used in making ………………..

a. screwdriver b. tires c. eyeglasses d. gloves

5-Blimps are filled with ……………….. to rise up in the air.

a. oxygen gas b. helium gas

c. carbon dioxide gas d. atmospheric air

---

(2) Write the scientific term:

1-it is a light gas which used in filling blimps. (………………………….)

2- The ability of material to transfer heat and conduct electricity. (………………………)

3- A matter which used in making gloves because it is waterproof and flexible. (……………………)

(3) Give reason:

1-Helium is used to fill balloons and blimps…………………………….

2- Wood and plastic are used in making handles of cooking pans. ……………..

Model exam

(1) Choose the correct answer:

1. Flammability is a/an.........................

a. chemical property b. physical property

c. liquid d unobservable property

2. The space that is taken up by object is.................

a. density b. volume c. mass d. length

3................ is used to measure volume of liquids

a. Measuring tape b. measuring cup c. Ruler d. Scale

4. Rubber is used to make gloves, as it is......................

a. hard b-flexible

c transparent d. good conductor of electricity

(B) Give reason:

Human can use helium gas safely.

....

---

(2)Complete:

1. Blimps con float in the air, as they are filled with....... (Oxygen – helium)

2. Mass of jewelry is measured in .... (gram – kilogram)

(B) Choose the odd words

2. Color - Rusting - Texture- Odor

1. Copper - Iron - Plastic – Aluminum

(3) Put √ or ×

1. Handles of cooking pans are made of wood or plastic because they are bad conductor of heat
2. Glass is used in making windows, because the glass is a transparent material.
3. Rubber is very hard, so it is used in making athletic shoes.

(B) Write the scientific term

1. It is a light gas which is used in filling blimps. (………………)
2. The ability of material to transfer heat and conduct electricity. (…………………….)
3. A matter which is used in making gloves because it is waterproof and flexible. (………………)
4. They are responsible for measuring and mapping earth surface. (……………….)

---

(4) Choose from column (B) what suits it in column (A)

(A)	(B)
1) Thermometer 2) Ruler 3) Measuring cup 4) balance	a. is used to determine the length of a book b. is used to determine the mass of some apples. c. is used to determine the temperature of some ice cubes. d. is used to determine the volume of water e. is used to determine the shape of a book.

1. ………………. 2. …………………………… 3. ………………………… 4. …………

Temperature effect

- When you put a cup of juice on the freezer, the juice ………

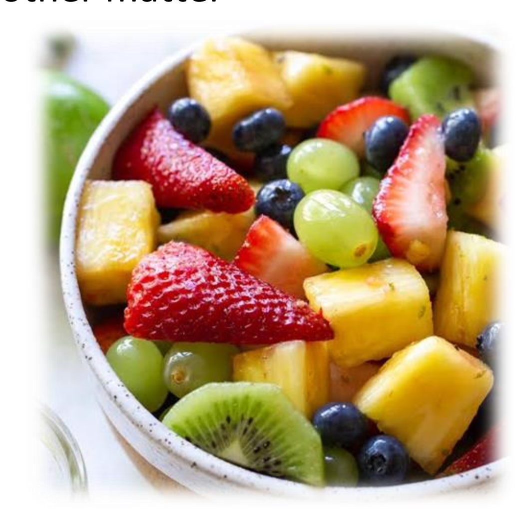
Remain liquid as it is ☐ Turn into ice. ☐

- When 1 kg of ice turns into liquid, its mass……………………..
-

Remain as it is. ☐ Decreases ☐ increases ☐

Conclusion:

The mass of any matter does not change when it is heated, cooled or mixed with other matter



The mass of any of the fruits **before** mixing with other fruits is the **same after** mixing with other fruits.

Melting Matter

<u>Put the suitable word from those between brackets under the picture.</u>

(Solid – liquid – gas)



……………. state



……………. state



……………. state

Melting

- It is a process in which a matter is changed from solid to liquid state when its temperature increases (by heating) .

Matter can be found in solid, liquid or gas state which we can differentiate between them by identifying their properties such

Solid	**Liquid**	**Gas**
		
- Definite volume and shape. - very hard	- Definite volume. - No definite shape. (take the shape of their containers)	- No definite volume. - No definite shaoe .((take the shape of their container)

Note

Matter can be changed from one state to another **without any change in its amount** so there is no change in the total number of particles of the matter during the change of the state of matter

Particles

Thermal energy It is an energy in the form of heat.

- ✓ Thermal energy is not a physical thing (material)
- ✓ We use thermal energy every day in many things such as Cooking and food.



Particles in motion

- ✓ Any matter is made up of very **small particles.**
- ✓ Particles in matter are always **in motion.**
- ✓ When particles of a matter absorb more thermal energy, they move, vibrate and spin around faster that causes this matter becomes warmer



Notes

1. When particles are **cooled down**, particles move slower and come close together.
2. When particles **are warmed**, they move faster and spread out.
3. **Light energy is like thermal energy** when particles of a matter absorb them, particles move, vibrate and spin faster.

Worksheet

1 Choose the correct answer:

1. When ice melts, it turns from .... state to

a. liquid - solid b. solid – liquid c. liquid – gas d . solid - gas

2. When ice kept in a cold temperature, it ....

a. turns into water . b. turns into steam .

c . remains as it is . d. becomes unclear .

3. Which of the following matter takes the shape of container but has a definite volume? ......

a. Milk. b. Ruler. c . Water vapor. d. Apple.

4. All the following happen to the particles of oil when it is cooled, <u>except</u> that they........... .

a. move slower c. vibrate less

b. move faster. d. come close together

5. When we heat a liquid, the distance between its particles will

a. decrease .

b. increase .

c. not be affected .

d. become zero .

6. Which of the following matter its particles are very close together?

a. Oxygen gas . b. Water. c. Oil d. Wood.

7. When the water is heated, its particles……………………

a. move slower. b. move faster,

c. move with the same speed. d. do not move

2 Put (v) or (x) :

1. The mass of an amount of apple juice will change if we mix it with water. (   )
2. The mass of some pieces of ice will be the same when they are melted. (   )
3. An ice cream turns into liquid by cooling. (   )
4. Water is considered as a liquid matter because it has definite shape and volume. (   )
5. When particles of a matter absorb thermal energy, they move slower. (   )
6. Particles of solid matter are spread out from each other. (   )

3 Write the scientific term of each of the following:

1. It is a process by which a matter is changed from solid to liquid state (……………..)
2. The state of matter in which matter has definite volume and shape. (………………)
3. The state of matter in which matter takes the volume and the shape of its container. (……………..)

4 What happens if.. ?

1. We cool some of tomatoes. (According to their masses).

………………………………………………………………………………………

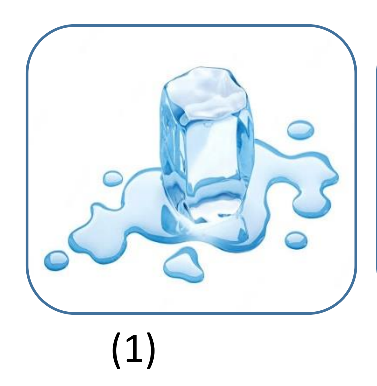
2. We increase the temperature of some ice cubes.

5 Give reasons for the following:

1. Ice is turned into water when it is placed in a warm room.
2. Juice is considered as a liquid state of matter.
3. Air doesn't have a definite volume or shape.

❻ Look to the following pictures, then complete:

0


(1)


(2)


(3)

1. Picture (.............) is considered as a solid matter because ....
2. Picture (..............) is considered as liquid matter because.................
3. Picture (..............) is considered as a gas matter because.................
4. Picture (...............) Melting → picture (...............)

---

❼ Complete the following:

1-when we heat an ice cream, it .... and becomes liquid.

2. Melting process occurs by .... the temperature of matter.

3. When ice is melted, it changed from ....state to ....state.

4. Iron is a .... State of matter that has definite ....and ....

5. Air is considered as an example of ....state, because it takes the ....and ....of container.

6. When an amount of liquid is heated, the speed of its particles will ....

Lesson (2)

Changing States of Matter



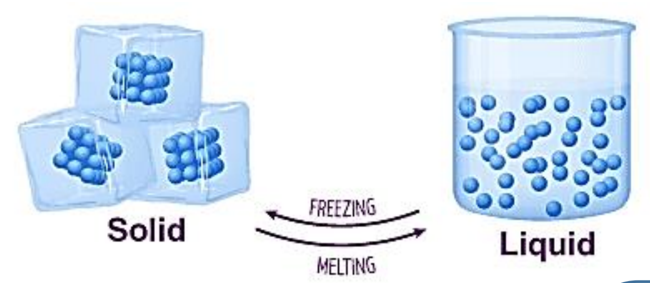
Melting process →

← Freezing process



- When a solid matter is heated up, it is changed to liquid matter.
- When a liquid matter is cooled, it is changed to solid matter

When the particles of the solid matter gains heat, their speed increases and they move around more.

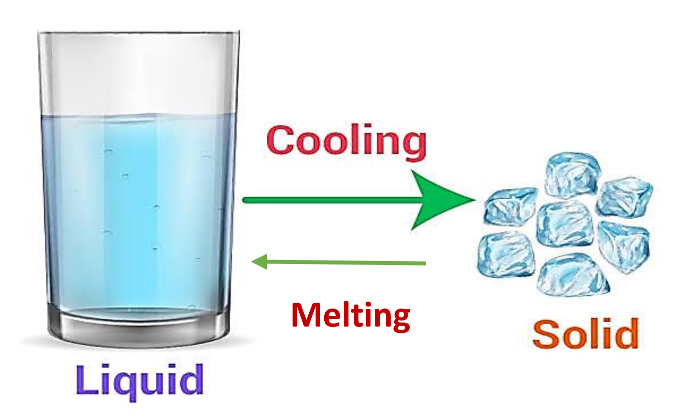




Physical change

- It is a change in matter without any change in its structure (makeup

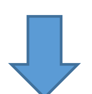
Ex: Melting chocolate, its taste, colour and smell don't change.



When the temperature of liquid water decreases below 0°C, its particles release energy



They move slower, so

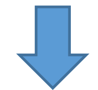


Liquid water changes to solid water

When the temperature of solid water increases above 0°C, its particles gain energy



They move around more, so



Solid water changes to liquid water

Note

1- 0°C: - **The freezing point of water.**

2. 100°C: **The boiling point of water**

2-°C (Celsius) is **the measuring unit of temperature.**

3- The physical change **is reversible**

Evaluation

1 Choose the correct answer

1. Physical changes of matter include.

a. melting only.

b. freezing only.

c. neither melting nor freezing.

d. both melting and freezing.

2. Increasing the temperature of a matter means that its particles

a. have low energy.

b. have very low energy.

c. have high energy.

d. don't have energy.

3. The reversible changes of matter are usually

a. physical changes only

b. chemical changes only.

C. both physical and chemical changes.

d. neither chemical nor physical changes.

4. In freezing process, the particles of matter lose energy and.

a. move with high speed.

b. move with low speed.

c. move with very high speed.

d. don't move

5. When the temperature of water is decreased below 0°C, it will be turned into

a. water vapor. b. clear water. C. coloured water. d. ice.

6. …………………… is the solid state of water.

a. water b. ice c. water vapour d. steam

7. Which of the following is an example of changing of solid into another state of matter?

a. breaking a chair into pieces
b. Melting of wax.
c. Cutting a piece of water.
d. Water freezing

2 Put (√) or (X):

1. When ice is heated, it will freeze. ( )
2. When a solid matter gains thermal energy, it will change into liquid state. ( )
3. Freezing takes place by cooling, while melting takes place by heating.
4. Increasing temperature means that particles of matter have low thermal energy. ( )
5. Melting and freezing are reversible processes. ( )
6. Water remains liquid between 0°C and 100°C. ( )
7. The mass of substance stays the same after heating. ( )

3 Write the scientific term of each of the following:

1. They are changes in matter which are usually reversible and don't affect its structure. (....................)

2. It is the process by which the particles of matter gain energy and changes from solid to liquid state. (....................)

3. It is the process by which the particles of matter lose energy and changes from liquid to solid state. (.....................)

4. The state of water when its temperature is between 0°C and 100°C

(.....................)

4 What happens to?

1. The particles of water when its temperature is decreased below 0"C.

....

2. A piece of chocolate if it is exposed to sun ray for a period of time.

....

5 Give reason:

1-When the temperature of ice cubes increases, they will melt.

....

2- Both melting and freezing are considered as physical changes.

....

What's the Matter? Changing the states

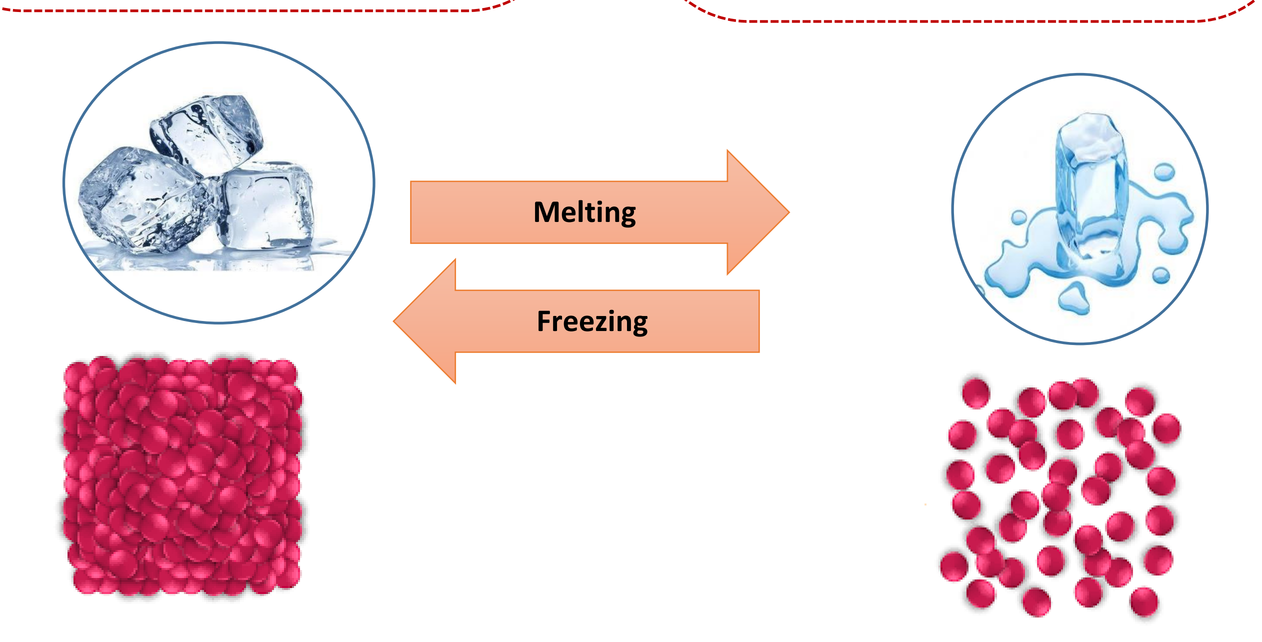
Changing of states that happen in water

(Melting)

The ice gains thermal energy so the particles **move faster** and separate that cause the change of the ice from solid state to liquid state.

(Freezing)

The particles **move slower** and **get close together** that cause the change of the water from liquid state to solid state.



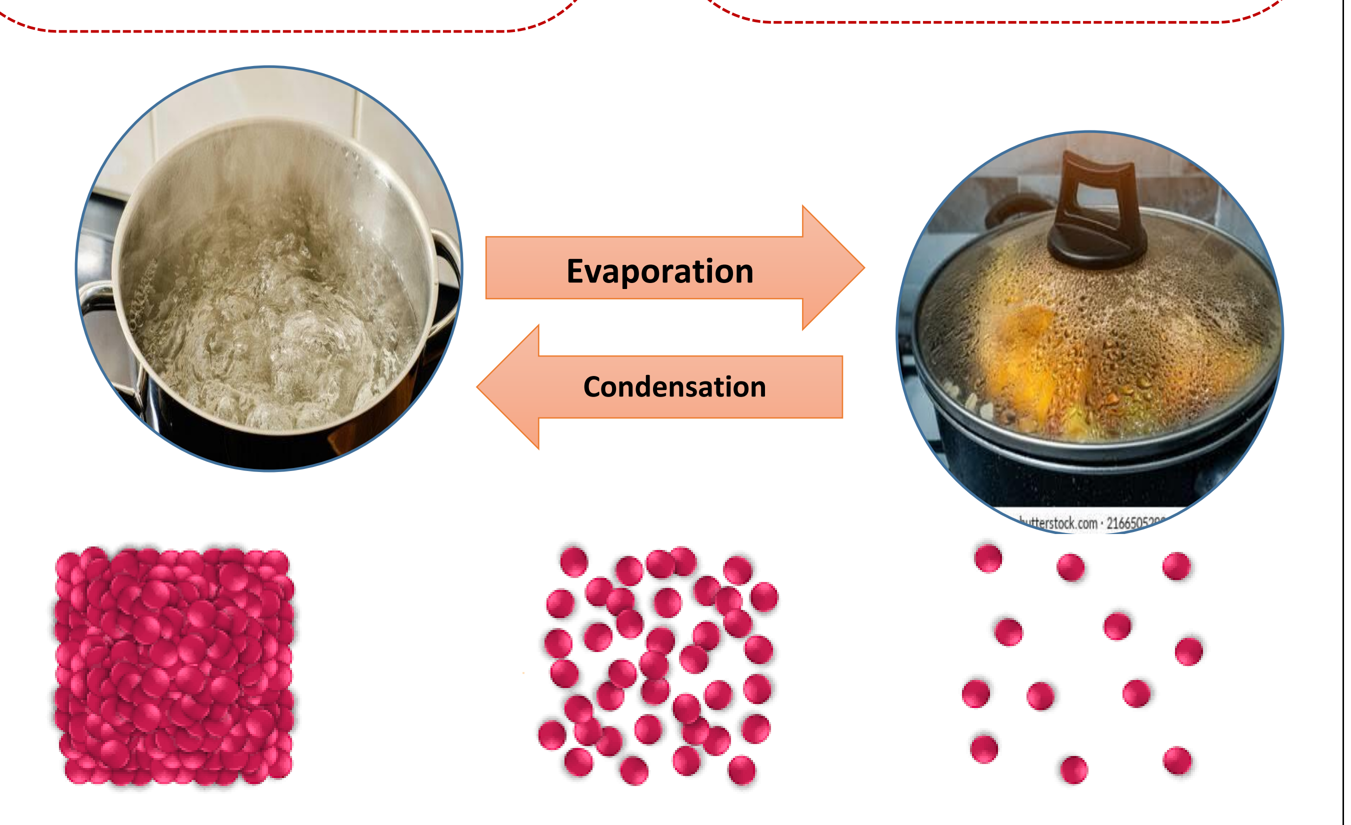
(Evaporation)

Water gains thermal energy so, the particles move faster and spread more that causes the change of the water from liquid state to water vapor

(Condensation)

- When water vapor touches a cold lid,

The thermal energy of the water vapor is transferred to the cold lid so the particles move slower and get closer together that causes the change of the water vapor from gas state to liquid state



Melting: Changing from solid state to liquid state.

Freezing: Changing from liquid to solid state.

Evaporation: Changing from liquid to gas state.

Condensation: Changing from gas to liquid state.

Lesson (3)

Real-World Mixtures

Mixture

- It is a form matter made of two or more different components, don't comine chemically.

Examples



Atmospheric air



Fruit Salad



Salt in water

Types of Mixture

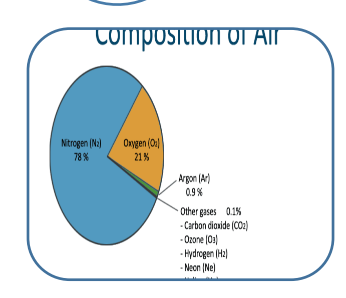
- Solid -Solid mixture
- Solid - liquid mixture
- Gases-Gases mixture



Sand and rocks



Salty water



Atmospheric air

(Oxygen nitrogen and other gases)

Properties of Mixture

- It consists of two or more materials.
- All materials that form a mixture don't combine chemically.
- Each material in a mixture **keeps its properties** that you can use to identify it such as :-

Sugar does not lose its sweetness when it is dissolved in water.

- The components of a mixture can be separated after mixing them.

Mixture and Compound

Mixture	Compound
A mixture is a matter formed of two or more materials. Its components don't combine chemically and don't form new substances. Ex : **Salty water**	A mixture is a matter formed of two or more materials. Its components combine chemically to form new substance. Ex : Pure water

Separation of Mixture

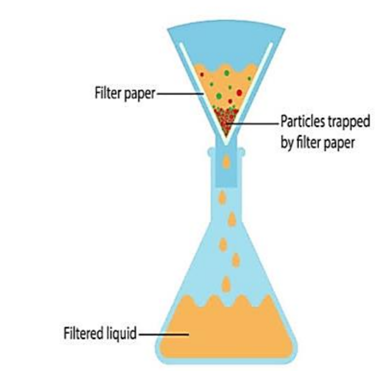
Ways of separation of mixture

Filtration

It's used when one material has smaller particles than the other.

Ex : sand and water

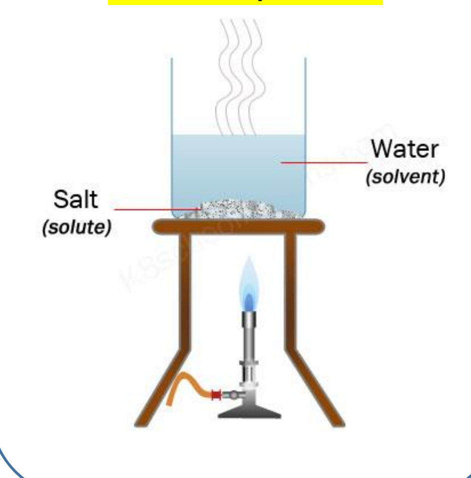




Evaporation

It's used when mixtures have materials evaporate at different temperature.

Ex :- salty water



Worksheet

1 Choose the correct answer:

1. Physical processes which need heating include……..

a. melting and freezing. b. melting and condensation.

C. melting and evaporation. d. freezing and evaporation.

2. The two processes which cause particles of matter get close together are….

a. freezing and condensation. b. freezing and melting.

c. freezing and evaporation. d. melting and condensation

3. To change water from solid state to liquid and then to gas state, we need to………..the temperature.

a. fix b. increase C. decrease d. reduce

4. Condensation changes the matter from state to ...State.

a. solid-liquid b. liquid - gas

C. gas- liquid d. liquid- solid

5. When we boil water, it will ……….

a. condense. b. freeze.

C. melt. d. evaporate.

6. To separate sand only from salty water, we can use ………………process.

a. filtration b. evaporation c. freezing d. melting

7. Salt can be separated by ……………. of salty solution .

a. melting b. evaporation c. freezing d. Condensation

2 Write the scientific term of each of the following:

1. It is the process by which matter changes from liquid state to gas state. (…………………………….)

2. It is the process by which matter changes from gas state to liquid state. (…………………………….)

3. It is the substance that consists of more than one matter which don't have any physical or chemical change in their properties.
(……………………….)

4. A matter that is formed when two or more materials combine chemically. (………………………….)

3 Complete the following sentences:-

1. Water can change from the liquid state to ……….state by increasing its temperature.

2. The distance between particles of water is very small in case of its state. ……………….

3. When two substances combine and form a new substance, this new substance is called a …………………….

4. To separate mud from salty water we can use ………………… process.

5. To separate salt from salty water we can use …………….…… Process.

6. By decreasing the temperature of water vapor, it release ……………… Energy and changes into water.

4 What happens to?

1. The particles of water when its temperature is decreased below 100"C.

2. Salty water when heating it for a long time.

5 Give reason:

1. Formation of water drops when water vapor touches a cold surface.

……….

2. Fruit salad and salty water are considered as mixtures.

……………………………………………………………………………………………………..

6 Mention the type of mixture in each of the following

……………………………

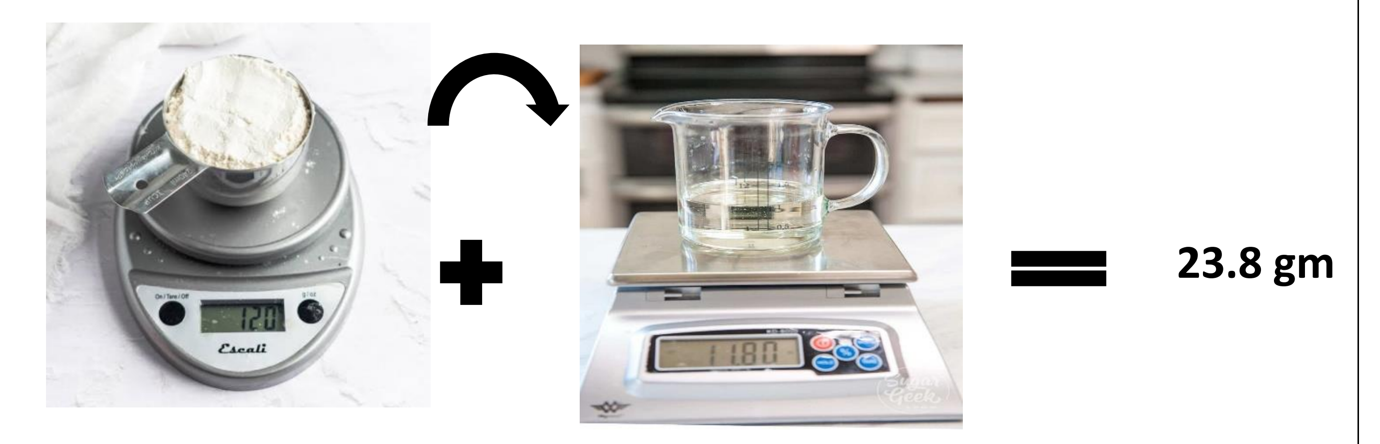
……………………………

……………………………

……………………………

Mixing up with Mass

The masses of substances before mixing are equal to the masses of these Substances after mixing when their properties don't change.



Masses before Mixing = Masses after Mixing

Worksheet

1 Choose the correct answer:

1. By adding baking soda to vinegar a ………. is formed.

a. powder   b. compound   C. mixture   d. solid matter

2. If we mix two equal masses of salt and oil so, their total mass will…………. after mixing.

a. equal to zero.   b. decrease   C. increase   d. not change

3. The ……..of iodine will not change after mixing it with starch.

a. mass only   b. color only

C. color and mass   d. properties and mass

4. By adding iodine to starch, the color of the formed compound will change into.

a. orange.   b. yellow.   c. dark green.   d. dark blue.

2 Put (✓) or (X):-

1. The mass and properties of oil will change when mixing it with vinegar. ( )

2. The properties of mango will be the same if we mix it with banana. ( )

3. By adding iodine to starch, their masses and color will not change. ( )

4. If we add 10 gm of salt to 5 gm of pepper, the mass of mixture will be 15 gm. ( )

Lesson (4)

Properties of Mixture

Properties of mixture:

1- Mixtures are made of two or more substances that are physically combined

2- -The substances that form mixtures can be physically separated by evaporation or filtration.

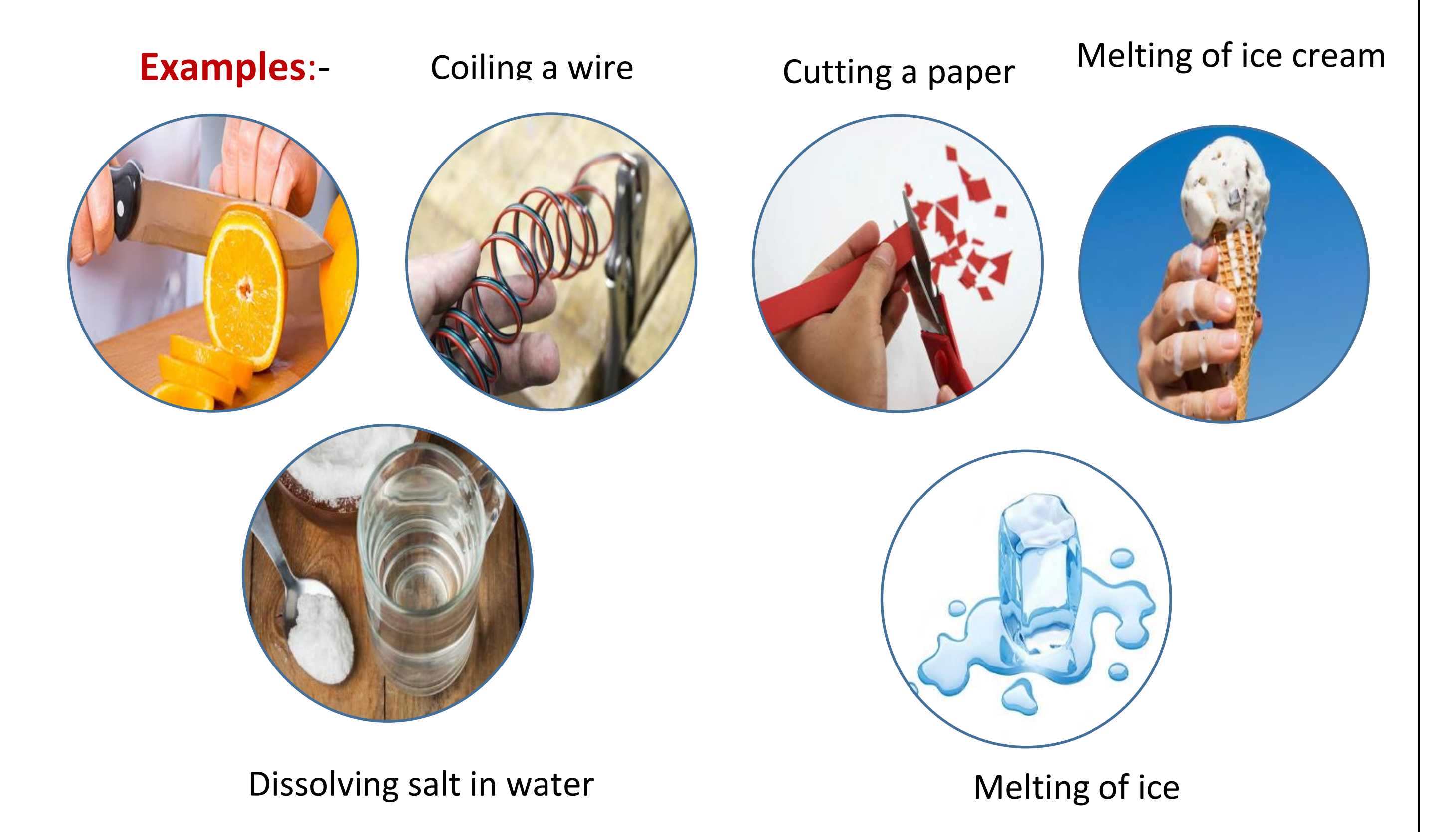
3- Solids, liquids and gases can form mixtures

Physical Changes of matter

Physical Changes

- The change in the shape of the matter only .

Examples:-



Coiling a wire

Cutting a paper

Melting of ice cream

Dissolving salt in water

Melting of ice

Chemical Changes of matter

Chemical Changes

- The change in the structure of matter producing a new substance..

Examples:

`



Burning of paper.

It turns into ash



Burning of match.

Produces heat and light



Adding Vinegar to baking soda

produces gas bubbles of carbon dioxide



Making a bread

Produces gas bubbles when the yeast is added .

Notes

- There are important chemical changes take place inside your body where chemicals produces to **help in food digestion**.
- The chemical changes are not reversed easily**.**

Worksheet

(1) Choose the correct answer:

1- Sugary solution is a ………………. Mixture.

a. solid – sloid b. liquid – solid c. liquid – liquid d. gas –gas

2-Which change is making a change in matter structure?

a. Physical change b. chemical change

c. shaping c. Melting

3. Which of the following is a sign that a chemical reaction has occurred?

a. Change in shape b. Melting

c. Formation of gas d. Dissolving

3. Among ways of mixture separation is/ are ……………….

a. evaporation only b. Filtration only

c. evaporation and rusting d. evaporation and filtration

4. Burning paper is considered as ………………. change of matter.

a. only chemical b. only physical

b. Both physical and chemical d. neither physical nor chemical

5. Among mixtures between two liquids is …………………..

a. vinegar and salt b. orange juice and apple juice

c. salty water mixture d. sand and water mixture

2 Put (√) or (X)

1. Mixtures are formed by a combination between two substances or more chemically. (   )
2. You can taste the salt in salty water mixture. (   )
3. You can separate oil from water by filtration process. (   )
4. Atmospheric air is considered as a mixture because it consists of liquids and gases matter. (   )
5. Formation of ash during burning of paper is considered as a change which forma new substance. (   )
6. Melting of wax produces new substance. (   )
7. Cutting a piece of cloth is considered as a physical change because it produces a new substance. (   )
8. When you strike a match, light energy and electrical energy are produced. (   )

3 Complete the following sentences:

1. We can separate dusts from water by using ……………process.
2. Cutting a paper into pieces is considered as a…………… change, while burning it is considered as a ………………… Change.
3. Making salad doesn't produce…………. Substance.
4. The reaction between some metals and…………… gas causes loss of their shining, and this reaction is considered as a…………………change of matter.
5. Melting of wax is a……………….change, while burning of wood is a………………change.

Chemical changes

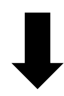
- Chemical change occurs when two or more substances are combined forming a new substance

- This new substance has different physical and chemical properties from the original substance
- Examples :

1- Iron Rusting



Iron + oxygen + water

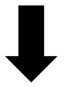


Rust (iron oxide) (red colour)

2- Burning paper



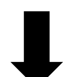
Oxygen +carbon+ hydrogen



Fire (which can change wood into ash)



3- Adding Vinegar to baking soda

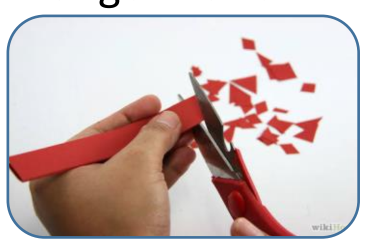


They form gas bubbles

How it changed?

Some evidences that describes physical changes

1-Change in size.

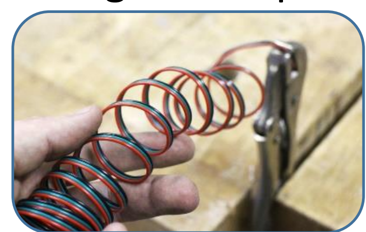


- Cutting paper



- Cutting a fruit

2-Change in shape.



- Coiling a wire



- Flow of sand from an hourglass

3-Expected change in colour.

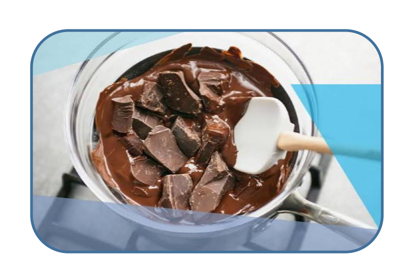


- Adding a drop of food color in water



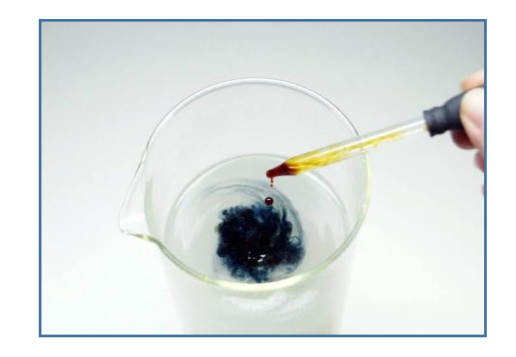
- Coloring a paper

4-Change in state of matter.



- Melting chocolates

Some evidences that describes chemical changes



1- Unexpected color change

Example

When mixing **iodine** with **cornstarch**, a new substance is formed and its color is dark blue.



2-Formation of gas bubbles

Example:

When mixing baking soda with vinegar, gas bubbles appear



3-Formation of strong odour

Example:

Leaving a cup of milk out of the fridge for about two days can produce a bad smell

Evaluation

1 Put (√) or (x):

1. Burning of wood is a chemical change. ( )
2. When dissolving salt in water, the salt disappears forming a new substance. ( )
3. Rusting of iron doesn't change the structure of iron. ( )
4. During chemical change, the properties of the matter will be changed. ( )
5. We can separate baking soda from vinegar easily after mixing them together. ( )
6. There is a change in shape when you coil a piece of paper. ( )
7. When living a cup of milk out of the fridge for a long time, it will form a new substance. ( )

2 Complete the following table:

Change	Physical or chemical change	Evidence
-Melting a piece of butter	……………………………	……………………………
Frying an egg	……………………………	……………………………
Painting a piece of wood	……………………………	……………………………
Melting of chocolate	……………………………	……………………………
Adding vinegar to baking soda	……………………………	……………………………
Iron Rusting	……………………………	……………………………

Lesson (5)

STEM in action

Many people around the world cannot reach fresh water although about 70 % of the surface of the Earth is covered by oceans. But we cannot drink the water of oceans and seas because it is a mixture of water, salt, other minerals, gases, living organisms and dead organisms.

But we can use **desalination** processes to drink this water

Desalination:

It is the process of removing salt from water.

- **How do we separate fresh drinkable water from the mixture of ocean's water?**

1- Filtration

✓ It removes any large materials such as seaweed, shells and fish.

2- Evaporation

✓ When boiling the filtered water, water vapor rises up leaving salts and other minerals.

✓ When cooling the water vapor, it is turned into liquid water and it is safe to drink it.

Problem of desalination

1-It requires a lot of energy.

2-It is very expensive process.

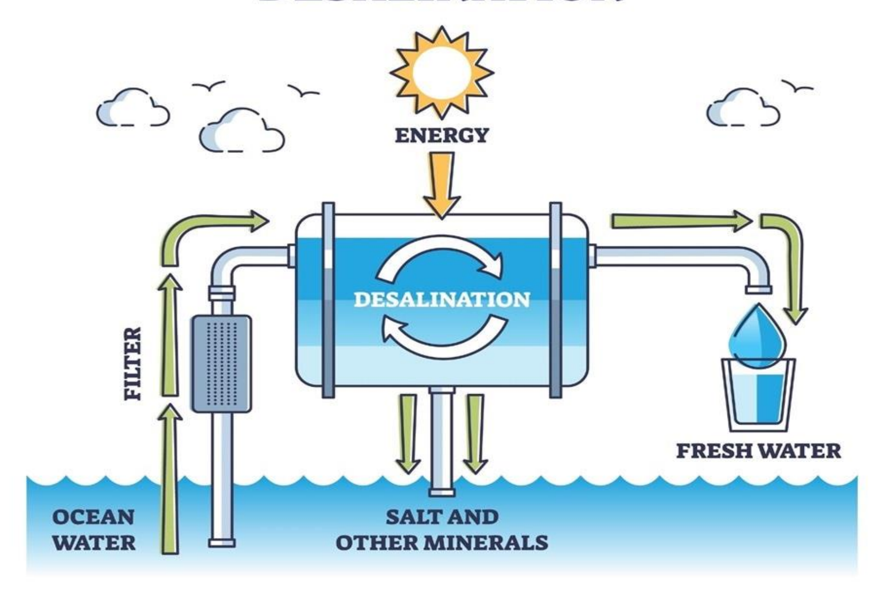
3-It may lead to environmental problems such as:

- ✓ Small marine organisms can be hurt due to sucking of water into the desalination plants.
- ✓ The water that contains a very big amount of salt that is pumped back to oceans after desalination can be dangerous to the marine life.

Note

1. Drinking salt water makes the human body dehydrate faster which means that the human body loses water faster.

2. Egypt has over 80 desalination plants.



General Exercises

(1) Choose the correct answer

1. Melting is the opposite of………………. (freezing - evaporation)
2. When water vapor is cooled, it will be…… (frozen - condensed)
3. Particles of matter are in a…………….state. (motion - static)
4. Seeing drops of water on glass windows is the result of

   (Condensation - evaporation)
5. The boiling point of water is……….. (0 C - 100°C)
6. Iron reacts with .... in the air and gets rusted.(Oxygen - nitrogen)
7. Digestion is a ....…………..change. (Chemical – physical)
8. ……………is two or more substances, each of which retains its properties. (Compound - Mixture)
9. The components of . can be separated easily using magnet.

   (sand and rocks - sand and iron nails)
10. Ice water and liquid water have the same………..(structure - shape)

(2) Put (√) or (×)

1. Melting of ice changes the structure of water. (   )
2. By increasing temperature, the particles of matter lose energy and become faster. (   )
3. The mass of the solid mixture is greater than the mass of the mixture components before mixing. (   )
4. During changing liquids into solids, the particles move away from each other. (   )
5. If the sum of masses of different substances equals 30 gm, then the mass of their mixture is more than 30 gm. (   )

6. If you keep the milk out of fridge, a chemical change would occur. (   )
7. Solids and liquids both have a definite shape. (   )
8. The particles of gases spread out and move quickly and randomly. (   )

4. Classify the following into chemical and physical changes

a. Making a golden ring from a piece of gold. (……………………..)

b. An orange fermentation. (……………………..)

c. Making a cake. (……………………..)

d. Making a chair from wood. (……………………..)

e. Cutting a piece of paper into small pieces. (……………………..)

f. Burning a piece of paper. (……………………..)

g. Dissolving salt in water. (……………………..)

h. Putting a bottle of water in the freezer. (……………………..)

i. Making an iron nail from a piece of iron. (……………………..)

(5) Write examples of each of the following:

a. Solid-liquid mixture.(……………………..)
b. Liquid mixture.(…………………………………)
c. Reversible change. (…………………………..)
D. Irreversible change.(………………………..)

(6) Give reason :-

1. Air is considered as a mixture.
2. Making fruit salad is considered as a physical change.
3. Making bread is considered as a chemical change
4. . Formation of a layer with reddish colour on the surface of a wet iron wire after a period of time
5. Formation of a bad odour when milk is left out of the fridge for several days

(5)Choose the correct answer:

1. …………………. the gaseous state of water.

a. Ice b. Vapor c. Water d. Wax

2. The opposite figure represents the……….state of matter.

a. solid b. liquid

c- Gas d. matter

3.The opposite figure represents the………..state of matter.

a. solid b. liquid

c- Gas d. matter

4. Which surface melts a cube of ice faster?

a. Stove. b. A surface exposed to the sun.

c. A surface exposed to air conditioner d. No correct answer.

5. The piece of wood is a solid matter as a result of

a. its taste b. its fixed shape c. its odor d. its color

6. The particles number of matter are……………whatever their state.

a. variable b. fixed c. different d. moving

7. During heating particles, they………………..

a. move around b. transfer to another matter

c' stop moving d. No correct answer

8. The spaces between the matter particles in the ……….. state are very big.

a. Solid b. liquid c. gaseous d. liquid and gaseous

9. The change that is produced as a result of iron rusting is the same change produced from

a. melting of ice. b. making bread,

c. cutting a piece of cloth. d. breaking of glass.